

THE PAY *STILL* STINKS

Our salary satisfaction survey reveals that IT pros still feel underpaid. Their biggest gripe? Lousy bonuses. Page 44

E-COMM FACILITATORS

Infomediaries bring buyers and sellers together over the Internet. Here's how they do it. Page 58

DEFENSIVE CODE

Data filters are helping companies like Sears keep suppliers' Y2K problems from infecting critical systems. Page 38

COMPUTERWORLD

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NOVEMBER 1, 1999 • VOL. 33 • NO. 44 • \$4 COPY

NEW BANKING ERA TO CHALLENGE IT

Cross-selling, privacy issues face merged firms

BY THOMAS HOFFMAN

Proposed federal legislation that would allow banks, brokerages and insurers to merge would mean business opportunities on Wall Street and potential hurdles for information technology.

For IT executives, especially at banks that are expected to drive a lot of these deals, there would likely be a lot of work ahead to ramp up customer information systems to cross-sell new insurance and investment products, observers said. That



PRUDENTIAL'S JONATHAN VAUGHAN: Compensation conflicts could arise

could mean developing new applications or using new technologies to analyze customer data. And any new law is likely to include consumer privacy protections, although critics say they aren't strong enough.

Compared with brokerages and insurance companies, banks historically haven't been as adept at selling their products and services because "they have been more transaction- and product-oriented, not customer-focused," said Bill Bradway, an analyst at Meridien Research Inc. in Newton, Mass.

The opportunity — and *Banking, page 89*

'FAULTY' INSTALL SPURS LAWSUIT

Fabric maker says HR system hurt operations

BY CHRISTINE MCGEEVER

W. L. Gore & Associates Inc., maker of the waterproof fabric GoreTex, last week sued PeopleSoft Inc. and Deloitte & Touche over an allegedly bungled software installation.

Gore stands to win more than \$10 million if a Delaware court awards it treble damages.

The suit, filed last week,

charges the software maker and the consultancy with failing to properly install PeopleSoft's Human Resources Management System to the point of damaging Gore's business operations.

The suit alleges that Deloitte & Touche consultants weren't the PeopleSoft experts they purported to be and that Gore, in Newark, Del., "suffered because of PeopleSoft's and D&T's scheme to defraud and failure to perform as promised."

According to the suit, Gore paid Deloitte & Touche, in Wilton, Conn., approximately \$3.5 million for the software implementation, not including *PeopleSoft, page 89*

FAILED ERP GAMBLE HAUNTS HERSHEY

Candy maker bites off more than it can chew and 'Kisses' big Halloween sales goodbye

BY CRAIG STEDMAN

A \$112 million ERP project has blown up in the face of Hershey Foods Corp., which last week said it's still struggling to fix order-processing problems that are hampering its ability to ship candy and other products to retailers.

Analysts and sources in the industry said the Hershey, Pa., manufacturer appears to have lost a gamble when it installed a wide swath of SAP AG's R/3 enterprise resource planning applications, plus companion

packages from two other vendors, simultaneously during one of its busiest shipping seasons.

The sources said Hershey squeezed what was originally envisioned as a four-year project into just 30 months before going live with the full ERP system in July. That's when retailers begin ordering large amounts of candy for back-to-school and Halloween sales.

But the company said in mid-September that it was *Hershey, page 89*

Soured Project

The fallout from Hershey's problems with its new ERP system includes:

- A 19% drop in third-quarter profits and a 12% sales decline
- An inability to ship complete orders to some retail customers
- An increase in typical delivery times from five days to 12
- A 29% increase in year-to-year inventory costs
- Strained customer relations and expected market-share losses



ANN DELLIGATTA, chief operating officer at Autobyte.com, quickly learned when she joined the dot-com company that you can have 10 top-priority technology projects

FAST LANE

WE KNOW WHAT LIFE is like in a classic IT department. At a dot-com company, it's nothing like that. The IT operation at a Web-based business is a wild ride in which speed is king and the regular rules don't apply. Kathleen Melymuka examines the IT culture at four such companies — Autobyte.com, ETrade, Toysmart.com and Wingspanbank.com — and finds that risk-taking is embraced, time is the enemy and complete integration with the business is a given.

Report begins on page 54.

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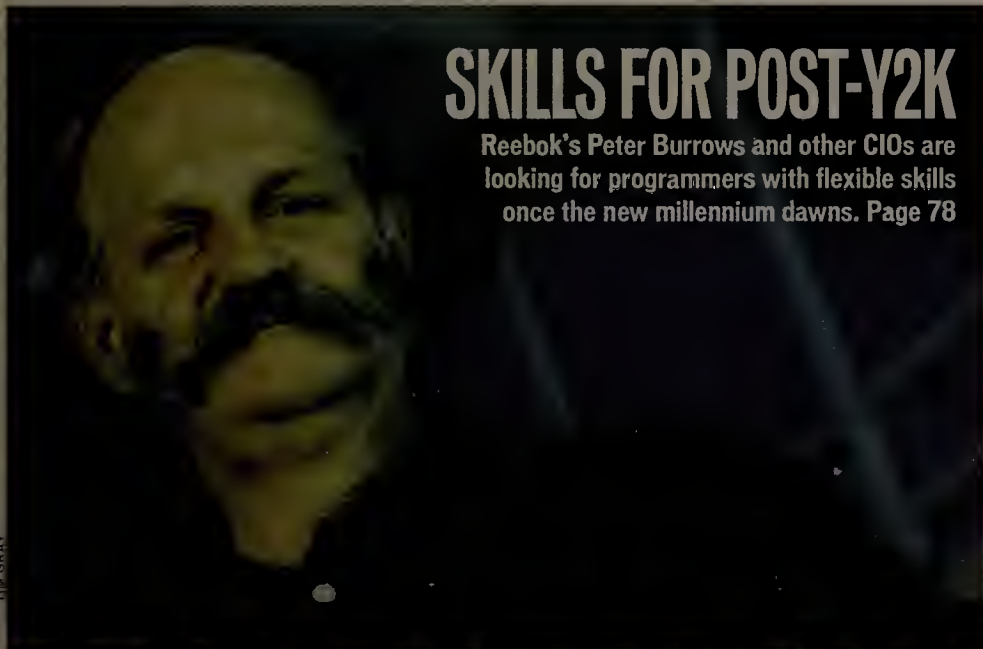
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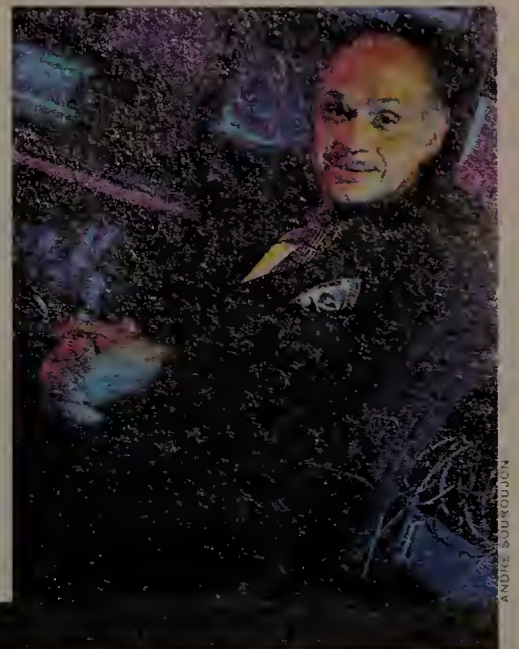
SKILLS FOR POST-Y2K

Reebok's Peter Burrows and other CIOs are looking for programmers with flexible skills once the new millennium dawns. Page 78

TIM GRAY

HOW DO YOU TELECOMMUTE?

Employees who work from home or on the road at least part of the time have become the rule, not the exception, at many successful companies. Prudential's Bob Piccarillo and other IT execs have revamped their telecommuting options, with good results. Page 70



ANDRE SOUKOUJON

COMPUTERWORLD THIS WEEK

NOVEMBER 1, 1999

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- 4 Y2K COMMAND CENTER** helps Prudential plan Y2K response, starting when midnight hits Japan, at 10 a.m. Eastern U.S. time.
- 6 FLEET BOSTON** launches a \$100 million investment in on-line financial services.
- 8 HP WARNS** that fourth-quarter earnings will be lower than expected due to Unix sales.
- 9 APP INTEGRATION** tool vendors streamline software for larger app combinations.
- 10 IT STOCKS UP** for Y2K emergencies, possibly causing economic fluctuations.
- 12 E-COMPANIES ASK** the Senate to let them come up with e-commerce and Internet standards.
- 14 MANUFACTURERS** synchronize sales forecasts and production plans to avoid overruns and delays.
- OPINION**
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- QUICKSTUDY**
- 69 THE WIRELESS** Application Protocol lets developers build networked applications designed for handheld wireless devices. Here's a look at how it works.
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- 76 1992:** Today, audio on the Internet is a standard capability, but that wasn't the case back in 1992 when it was demonstrated at an Internet Engineering Task Force meeting.

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AT THE END OF THE DAY . . . IF A STRATEGIC DEAL IS RIGHT, WHETHER YOU PAY A LITTLE MORE OR LESS DOESN'T MAKE ALL THAT MUCH DIFFERENCE.

JOHN SIDGMORE, VICE CHAIRMAN OF MCI WORLDCOM, ON THE COST OF THE COMPANY'S \$12.4 BILLION OUTSOURCING DEAL WITH EDS. SEE PAGE 24.

AT DEADLINE

Levi to Halt E-Sales

Levi Strauss & Co. plans to abandon selling its clothing line over the Web after Christmas, leaving that task to retailers like Macys.com., the company confirmed Friday.

Levi's had relaunched its Web site just three weeks ago, using Blue Martini's e-merchandising software and spending just under \$1 million on the product. Blue Martini couldn't be reached for comment.

The \$6 billion retailer, which has seen its revenue slide since 1996, has failed to generate the sales needed to offset the costs of maintaining the online presence. John Jordan, a director at the Ernst & Young Center for Business Innovation in Cambridge, Mass., said that Levi's pulling back from its e-commerce strategy may be a smart move given its finances.

Levi's spokesman Jeff Beckman said the company will continue to use its site to market Levi's and to direct customers to both online and other sources for its products. "It will remain a cool site," he said.

Patient Privacy Push

Federal regulations proposed by President Clinton Friday to protect the privacy of patient medical records could mean health care organizations will have to beef up their information technology security. Improper disclosures of patient information or selling information without a patient's consent could result in fines and jail time.

SportsLine Zaps Plans

New York-based CBS Corp.'s SportsLine confirmed it pulled the plug on a Web-based marketing scheme that up until late last week directed any Internet users who typed a Web address with "sports.com" in its name to the CBS SportsLine.com site. ESPN Inc.'s www.espn.sports.com had threatened legal action.

Group Slams Reviews

A labor group trying to unionize so-called permatemps at Microsoft Corp. charged that the company illegally withholds performance reviews from its long-term contract workers. Microsoft said it sends the reviews to the temp agencies that employ the workers.

Prudential Gears Up for New Year's

Insurer's 'command center' to monitor date change, system rollovers worldwide

BY KATHLEEN MELYMUKA
ROSELAND, N.J.

YEAR 2000 begins at 10 a.m. on Dec. 31 for Prudential Insurance Company of America.

That's when it's easternmost installation — Japan — moves into the millennium, and the Japanese systems experience will feed directly into the \$27 billion company's Global Command Center here.

The command center is a huge room fitted with a half-dozen rows of sexy, black, flat-screen monitors seated on long communal desks and facing three huge wall-mounted video screens that show the status of Prudential's mainframe and networks around the world.

The look and feel of the center is very much like the bridge of *Star Trek's* Starship Enterprise; vice president and Y2K manager Irene Dec jokes that her Capt. Kirk chair hasn't arrived yet.

Each area of the room is home to specialists in a particular platform who monitor their systems and hardware, looking to spot trouble before it escalates. When calls come in about system problems, a cluster of generalists takes the information, routes it to the appropriate group and makes sure the problem is solved.

A Foundation to Build On

During a tour of the center last week, Dec said the center opened in June 1998 to support Prudential's global infrastructure on a daily basis. "But if it didn't already exist," she said, "we'd have to build it" for Y2K.

Because it does exist, all Dec had to do was fine-tune it to monitor how the date turnover affects Prudential's 21 mainframes, 4,095 servers and 74,854 desktops in 1,466 locations in 30 countries. Prudential has 35 staffers in the com-

mand center and 5,200 information technology workers worldwide.

As the year turns, each Prudential location, from Tokyo to New York, will follow an identical minute-by-minute plan that calls for final batch runs on New Year's Eve and a freeze of all activity from 11:30 p.m. to 12:30 a.m. local time, followed by a precise schedule of reboots and quality checks, application

by application. Then, each site will report its status to the command center, which will

have a complete database of each site and its Y2K timetable. If the center crew doesn't hear from a remote site within the specified time frame, it will call to check.

Local staff will report problems immediately, along with

their best guess whether they are Y2K-related. This will help command center staff notice if any patterns are emerging, such as a certain network connection being involved in multiple problems.

If the local staff can't solve the problem, there's a good chance the command center

staff can. In their day-to-day battle to keep systems up, they have been able to solve 90% of



NICK CARDILICHO
IRENE DEC has set up a sophisticated global Y2K tracking center

First Users to Get Win 2000 in Mid-January

Microsoft hopes to let Y2K dust settle

BY DAVID ORENSTEIN

Microsoft Corp.'s enterprise customers will have the first commercial version of Windows 2000 by mid-January, and the operating system will be stocked on store shelves, factory-installed on PCs and in the mail rooms of integrators on Feb. 17, Microsoft said last week.

"We are putting a stake in the ground," said Keith White, director of Microsoft's business and enterprise division. Enterprise customers will receive code about two weeks after the "gold" Windows 2000 code is shipped to manufacturing at year's end. The retail shipping date, six weeks into the year, leaves Microsoft time to not only produce the CDs in their full retail packaging, but to also acknowledge the reality that very few information technology customers will pay atten-

tion to new products until year 2000 tension has died down.

"This could be the worst time ever to release a software product," said Rob Enderle, an analyst at Cambridge, Mass.-based Giga Information Group Inc. After it became clear to users that Windows 2000 wouldn't ship before August, the operating system was doomed to not see widespread rollouts begin until the second half of next year because of year 2000 concerns, he said.

Reuters Ltd. in El Segundo, Calif., for example, has frozen new technology deployments for Y2K reasons, both in its internal operations and in the software systems the company provides its customers of financial market data, said senior software adviser David Hamilton. After the new year, the company can begin testing the operating system, which Hamilton said looks promising to engineers, even though some assumptions about its reliability still have to be checked.

problems without consulting other systems engineers or vendors. But both will also be available as backup.

Dec and other executives will monitor the Y2K situation from an adjacent room, where their resources will include a television and cots for catnapping as the night wears on. "If I don't hear from a site and we can't contact them, we'll probably go to CNN," she said, adding that if international communications are disrupted, "the problems get a lot bigger than Prudential."

The Global Command Center will enable Dec, who has been renowned for running a very tight Y2K ship, to have her fingers on the pulse of the experience worldwide as it happens.

"Irene Dec has been a very, very big spokesperson for this [Y2K] activity and the chief nag to get this done," said Dale Vecchio, research director for year 2000 at Gartner Group Inc. in Stamford, Conn. "There are many multinationals trying to do the exact same thing, so it's not unique, though it may be one of the most sophisticated." ▸

MOREONLINE

For more coverage of Windows 2000 and links to related pages, visit our Web site. www.computerworld.com/more

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Fleet Bets \$100M on Web

New England banking giant to offer online stock trades, mutual fund services

BY JAIKUMAR VIJAYAN

FLEET BOSTON CORP. plans to sink \$100 million into its Web site in order to offer customers a wide array of online financial services.

In its biggest technology bet ever, Boston-based Fleet — the country's eighth-largest bank — last week confirmed it will roll out a variety of Web services over the next 18 months. The services, which will be phased in, range from basic online banking and stock trading to mutual funds, credit cards, auto loans, mortgages and bill payment.

As a first step, Fleet last week linked its Web site with its discount broker firm, Quick & Riley, so that the Web site www.fleet.com can offer a range of brokerage services in addition to online banking.

Fleet's immediate challenge will be to roll out the ambitious new services while integrating its systems with those of Bank-Boston Corp., which it acquired in a \$16 billion deal earlier this year.

Fleet joins a rapidly growing list of financial companies trying to meld online banking with a comprehensive range of investment and other online services. Giants such as Citi-

bank, Wells Fargo & Co. and Bank of America Corp. already offer similar services.

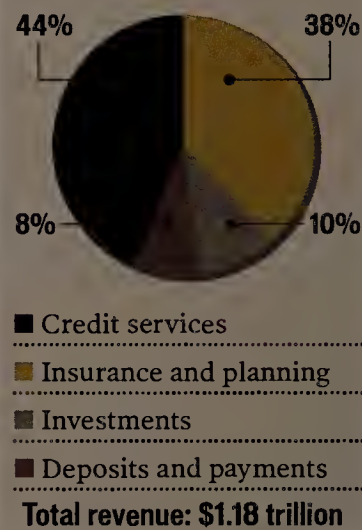
A few, such as Cleveland-based KeyCorp and Citibank, are going further, by offering Web-building and application-hosting services for their small and midsize business customers.

"All of them are ... working on bringing together their separate business units, such as banking, mortgages and credit cards, so they have a single face to the customer," said Robert Landry, an analyst at Tower-Group in Needham, Mass.

Banks will soon have to offer Web-based services very much the way they had to offer services via automated teller machines (ATM), Landry said. "Banks that chose to wait even-

Where the Money Goes

1999 U.S. consumer related financial services revenue:



SOURCE: MERIDIEN RESEARCH, INC., NEWTON, MASS.

tually had to deploy [ATMs] anyway because of competitive pressures," he said.

The challenge for large

banks like Fleet "will be to blend new Internet channels with other brick-and-mortar channels, such as branch offices and ATM systems," said Bill Bradway, an analyst at Meridien Research Inc. in Newton, Mass.

Home Court Edge

But Fleet has a leg up on some rivals: As New England's largest bank — with more than 8.8 million customers and more than 1 million already signed up for online banking — Fleet "has a home-court advantage," Bradway said.

Fleet is "committed to being innovative where it makes sense from a bottom-line" perspective said Jim Goodwin, director of online financial services at Fleet. But for the most part, "we are not going to be doing anything outside of our normal business right now," when it comes to online services, he said. ▀

Nissan N.A. Outsources IT to IBM

BY STACY COLLETT

Nissan North America Inc. has outsourced its entire information technology operation to Somers, N.Y.-based IBM Global Services in a \$1 billion, nine-and-a-half-year deal designed to help Nissan cut costs and streamline its IT operations, the firm said in a statement.

"It's a way for us to increase efficiency, become more competitive and be more effective in the information systems area," said Terry Hernandez, a spokeswoman at Gardena, Calif.-based Nissan.

Two-thirds of Nissan's 350-person IT staff have been hired by IBM, according to Hernandez. The rest have stayed with Nissan in other departments.

The move is part of Nissan's "revival plan" to develop its core business and cut costs, which was announced by Chief Operating Officer Carlos Ghosn Oct. 18 at the Tokyo Motor Show. Nissan plans to cut 21,000 jobs worldwide, reduce expenses by \$9.1 billion and grow market share and profits within five years. Nissan has been losing global market share continuously since 1991 and now claims 4.9% of all auto sales, down from 6.6% in 1991. Nissan also has suffered losses in profitability in seven of the past eight years.

"It's better in their cash flow to outsource this to IBM than to carry a large IT structure while they're trying to restructure," said Kevin Prouty, an analyst at AMR Research Inc. in Boston. "They're probably being overly optimistic that \$1 billion will translate into \$1 billion [or more in savings], but from a cash-flow standpoint, it will help them significantly," he said.

Though Nissan's revival plan is new, plans to outsource IT operations have been in the works for months. *Computerworld* reported in April that IBM Global Services was holding negotiations with Nissan IT staff in Irving, Texas, and Englewood, Colo. The outsourcing transition is scheduled to begin immediately. ▀

Windows 2000 Certification Rule Criticized

NT systems engineers must test on new OS

BY DAVID ORENSTEIN

A controversial move by Microsoft Corp. to phase out certification for IT workers who don't train on Windows 2000 is annoying but won't motivate companies to upgrade sooner, users said last week.

Analysts have begun to raise red flags about Microsoft's plans to force Microsoft Certified Systems Engineers (MCSE) to study Windows 2000 and be tested on it to retain certification even for Windows NT 4.0. It will also phase out tests for NT 4.0 at the end of next year, when many companies will still be using the operating system.

In a recent report, Cambridge, Mass.-based Giga Information Group Inc. analyst Laura DiDio wrote, "Giga takes umbrage with the fact that Microsoft is making this a 'forced march,' irrespective of customer migration plans." In the same report, however, DiDio

praised Microsoft for raising the skill requirements necessary to pass the new exams.

Meanwhile, British analyst firm Butler Group criticized Microsoft in a report last week for cutting off Windows NT 4.0 testing at the end of next year, calling it "a move that is being seen as clearly designed to force market acceptance of Windows 2000."

Technology Changes

A Microsoft spokeswoman said that for the MCSE credential to remain valuable, it must reflect knowledge of up-to-date technology. Also, the NT 4.0 certifications won't run out until the end of 2001, five years after the debut of NT 4.0, said Kylie Shunk at Waggener Edstrom Inc., a public relations firm in Portland, Ore.

Users said MCSE status is an important yardstick for hiring, but current employees losing certification wouldn't change how they work with Windows NT in their operations.

Robert Forbes, online technology manager at First Tennessee National Corp. in Mem-

phis, said if people at the company don't renew their MCSE status because of the changes, it won't hurt the bank's information technology operations. The value of the certification for existing employees is it helps show which workers are motivated to keep their skills sharp, Forbes said. When hiring new employees or consultants, it shows that they have at least some skills and are capable of learning.

An IT manager at a New England bank said he agreed that if employees lost their certification because they didn't pursue Windows 2000 training before it was necessary at the company, it wouldn't harm their ability to administer NT 4.0. The manager, who asked that his name not be used, recalled that Novell Inc. made a similar move during the transition between NetWare Versions 3 and 4. Ultimately, experience counts more than certification, the manager said. An uncertified prospect with five years of experience will win out over an MCSE with only one, he added. ▀

Corrections

The name of Quest Software Inc. was spelled incorrectly on the Stocks page ["Gainers" column, page 95] in the Oct. 11 issue.

The name of the company that makes the software that 2nd Century Communications Inc. is using [Short Takes, News, Oct. 18, page 14] is Cygent Inc.

In an Oct. 25 story ["Corporate Barter," Business QuickStudy, page 56] *Computerworld* misstated the name of the online barter company of which Steven White is CEO. The correct name is Ubarter.com.



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BRIEFS

Nasdaq Boosts Web Options

Nasdaq Stock Market Inc. plans to add a new feature to its Web site (www.nasdaq.com) that would let individual investors access their online brokers and execute trades, said Frank Zarb, chairman of Nasdaq's parent company, the National Association of Securities Dealers Inc. in Washington. NASD said the exchange hasn't set a deadline for delivering the capabilities to its Web site, though it expects to announce more information by mid-November.

KPMG Helps Westinghouse

Westinghouse Electric Corp. hired KPMG Peat Marwick LLP to help it make applications based on Microsoft technology interoperable with applications on other platforms. KPMG and Microsoft Corp. have formed a partnership in which KPMG will provide integration services using Visual Studio 6.0 and BackOffice 4.5 products.

EMC Unveils Control Center

EMC Corp. in Hopkinton, Mass., introduced EMC Control Center, software components designed to automate storage-management functions to improve system performance. Three components, Symmetrix Optimizer, Resource View and Symmetrix DB Tuner, are available. EMC said a typical installation will cost between \$100,000 and \$200,000.

Short Takes

COMPUTER ASSOCIATES INTERNATIONAL INC. announced beta programs for its help desk products - Unicenter TNG Advanced Help Desk Option 4.5, ServiceIT Enterprise Edition 4.5 (formerly known as Paradigm) and SmartDesk. . . . **ALLEN SYSTEMS GROUP INC.** released ASG-Vista for parsing and analyzing mainframe legacy systems via a Windows-like graphical user interface. . . . **STERLING SOFTWARE INC.** is shipping Eureka: Intelligence, a Web-based query, analysis and reporting tool that is 100% Java.

HP Sees Setback in Q4

Cites Unix sales force, component shortage for anticipated revenue hit

BY JAIKUMAR VIJAYAN

HEWLETT-PACKARD Co.'s Internet-led momentum suffered a setback last week after the company issued a fresh warning that its fourth-quarter earnings may be even weaker than previously suggested.

The company gave no quantitative indication of how widely it was off the mark. But it once again warned financial analysts of weak Unix server sales in North America and short-term constraints in PC component availability it said were caused by the recent Taiwan earthquake.

Unlike IBM's earnings warning the week before — which

cited a year 2000-related slowdown for lowered projections — HP blamed its problem on its Unix sales force, which the company is in the process of revamping.

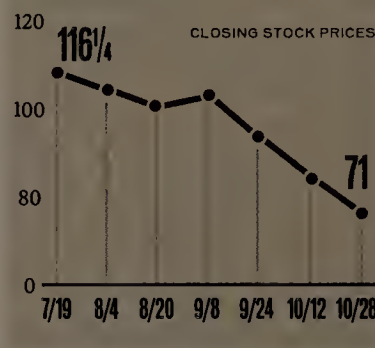
The impact on users, however, is likely to be minimal, analysts said, because HP's products are competitive.

The announcement — which came a few weeks after a similar one by HP CEO Carly Fiorina — triggered a steep 13% decline in HP's stock to \$67 on Wednesday, though the stock was up to more than \$74 on Friday.

Still, last week's numbers are a far cry from HP's all-time stock high of slightly over \$118, which came in mid-July as a result of widespread Wall Street

H-P Falls Into Autumn

Since trading at 118 7/16 on July 19, Hewlett-Packard's stock has fallen:



approval for the company's unfolding Internet strategy.

Since January, HP has announced more than 30 major initiatives and partnerships related to its so-called e-services plan.

The company hopes to position itself as a one-stop provider of a wide range of Internet hardware, software and integration services.

Wall Street's reaction to last week's announcement is more "an indication of the volatility of the stock market" than a reflection of long-term problems at HP, said Rich Partridge, an analyst at D.H. Brown Associates Inc. in Port Chester, N.Y.

"HP continues to have good products. What they really need to do is push their story better" at the high-end, against Sun Microsystems Inc., Partridge said.

Expressing surprise at the market's reaction, HP issued a statement claiming that its PC and imaging businesses — which together account for 75% of its revenue — are in excellent shape. ▀

Y2K, Turnover Blamed for Red Ink

Cambridge Partners predicts losses in fourth quarter

BY JULEKHA DASH

Cambridge Technology Partners Inc. said it expects revenue to be down and losses to be up for the fourth quarter, results it attributed to projects stalled due to year 2000 problems, fewer PeopleSoft implementations, high turnover and bonus payments.

Cambridge said it expects revenue for the quarter ending Dec. 31 to be around \$150 million, compared with \$160.2 million in the same quarter last year. That represents a reduction of almost 7%.

Although analysts had expected a quarterly gain of about 16 cents per share, Cambridge said it expects a loss of about 29 cents per share.

The Cambridge, Mass.-based

consulting and systems integration firm also posted third-quarter earnings that were slightly below analysts' expectations. Cambridge's earnings that quarter were \$10.7 million, or 18 cents per share, which included a five-cent gain on equity investments of \$4.4 million.

The company attributed part of the loss to employee bonuses, on which it will spend between \$12 million and \$17 million.

Tim Mead, Cambridge's vice president of corporate marketing, said the firm's 29% turnover in the third quarter was due mostly to departures among corporate employees — not consultants — who were lured by Internet start-ups.

But Mead said some consultants left because they were more comfortable at a firm with a singular focus. Cambridge has evolved from a custom software shop to an information technology services firm that offers many application implementation services, he said.

Michael Norris, an analyst at Fitzwilliam, N.H.-based Kennedy Information LLC, said Cambridge's turnover isn't atypical of a consulting company under financial duress. But the firm does need to articulate a clearer vision of where it's headed, he said. ▀

Justice Dept. Seeks to Block Compuware Merger

BY JAIKUMAR VIJAYAN

The Department of Justice's antitrust division said it would sue to block Compuware Corp.'s planned purchase of Viasoft Inc. because, the government alleged, the deal would result in higher prices for certain types of mainframe software.

Farmington Hills, Mich.-based Compuware hadn't decided at press time how it would respond to the Justice Department's move. Viasoft, in Phoenix, didn't respond to interview requests.

In July, Compuware bid \$167.5 million to buy Viasoft, its rival in the market for testing and debugging tools used in mainframe software application development, system monitoring and failure management. Compuware extended the tender offer, which was subject to regulatory approval, in mid-October. It was set to expire on Friday, said spokesman Gray Reynolds.

"There's three things we can do at this stage. We can walk away from the deal; we can

fight the lawsuit in courts, which could involve protracted legal dealings; or we can offer a settlement to the DOJ," Reynolds said.

The purchase of the \$104 million Viasoft would remove an important competitor and further strengthen the already dominant market position of the \$1.6 billion Compuware, said Joel Klein, assistant attorney general of the department's antitrust division.

"Unless this acquisition is blocked, major companies, governmental entities and universities will suffer the loss of competition, resulting in higher prices, less innovation and poorer service and support," he said.

One analyst expressed surprise at the DOJ's move. "Given that DOJ approved the CA/Platinum and CA/Legent deals, which had far more potential impact on software pricing and consolidating the software market, it's hard to understand this reticence," said Jonathan Eunice, an analyst at Illuminata Inc. in Nashua, N.H. ▀

Y2K Inventories Could Affect U.S. Economy

BY PATRICK THIBODEAU
NEW YORK

The information systems that have allowed companies to

tightly control inventories may have also reduced volatility in the U.S. economy. But if corporate managers override these

systems to build up inventories as a hedge against year 2000 problems, it could cause economic fluctuations, a top Fed-

eral Reserve Board official testified last week.

Charles Steindel, a senior vice president at the Federal Reserve Bank of New York, said improvements in inventory controls have allowed large

businesses to smooth out purchases. "We believe there is evidence suggesting that the adoption of these systems may have contributed to the reduced volatility in U.S. economic activity over the past 15 years," he said.

However, Y2K worries may prompt companies to build larger inventories as a buffer against supply disruptions, "adding some short-term fluctuations to the economy" late this year and early next, said Steindel before a hearing of the Senate Special Committee on the Year 2000 Technology Problem. The hearing was called to consider the impact of Y2K on just-in-time delivery and inventory systems.

However, Steindel and other economists who testified said a Y2K-induced economic slowdown would be only temporary. The strongest economic impact will come from "defensive stockpiling" expected this quarter, said William Dudley, an economist at Goldman, Sachs & Co. in New York. "Even a modest buildup of precautionary stocks" could push growth in this quarter by a percentage point and depress growth in the first quarter as built-up inventories are run down, he said.

Charles Himmelberg, a professor of finance and economics at Columbia University in New York, said that even in "the event of substantial Y2K failures," the risk to the U.S. economy is small and that companies "can be surprisingly resilient and resourceful in their ability to overcome short-term supply disruptions."

A case in point, said Himmelberg, is the 15-day Teamsters union strike in 1997 that all but shut down Atlanta-based United Parcel Service of America Inc. It disrupted the supply chains at many companies, and the PC industry in particular was vulnerable because so many PC companies produce on order, he said. But manufacturers were able to use alternative carriers, and PC makers didn't suffer major disruptions, said Himmelberg.

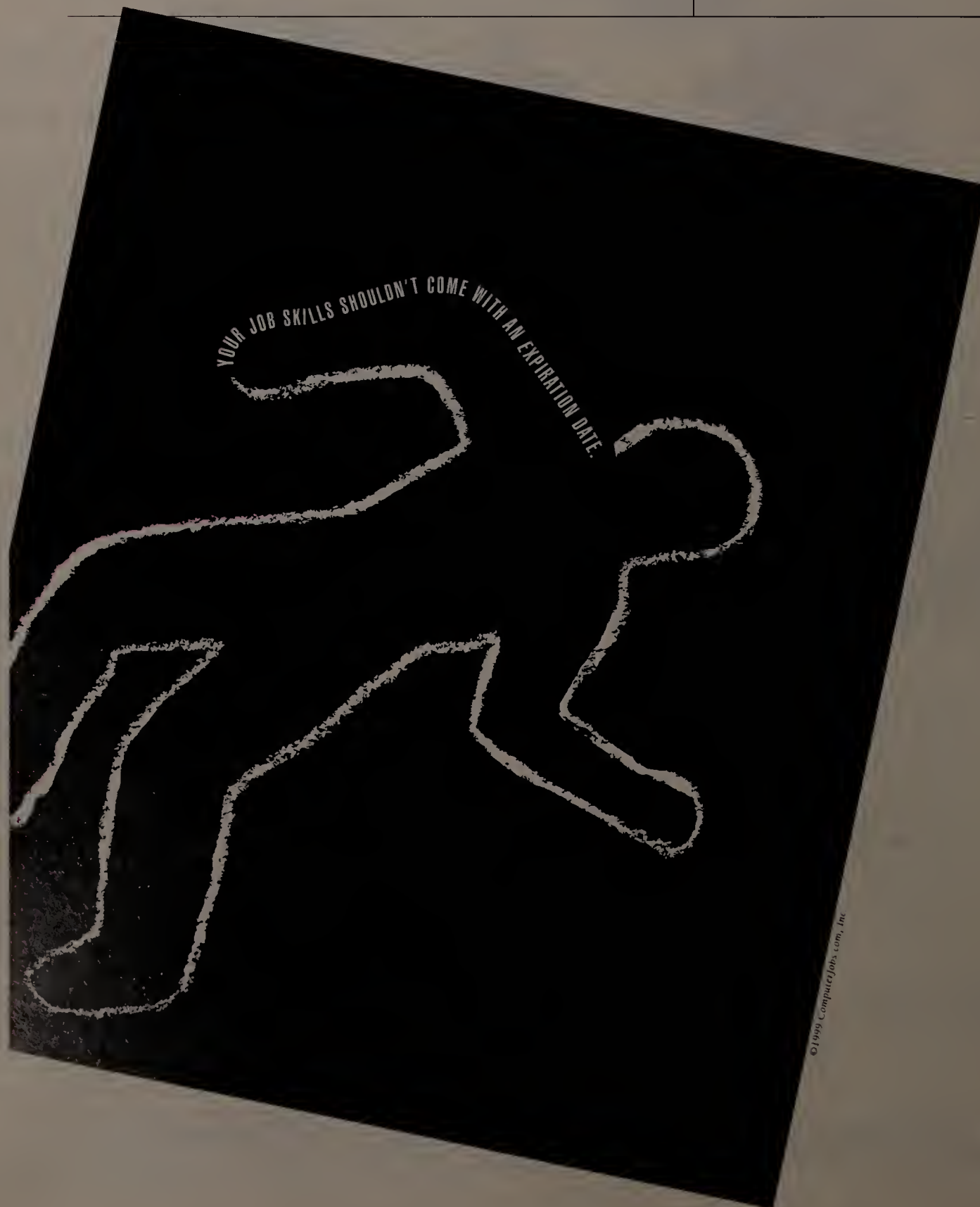
But Leonard Neely, an analyst at Meta Group Inc. in Reston, Va., said just-in-time manufacturing can pose significant risk. When a General Motors Corp. stamping and fabrication plant went on strike in 1992, other GM plants were affected, costing the automaker millions. ▀

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A man in a light-colored uniform is walking through a warehouse aisle, pushing a shopping cart filled with various toys. The aisle is lined with tall metal shelving units. The lighting is dramatic, with strong shadows and highlights, creating a sense of depth and perspective. The background shows a large, dark structure, possibly a loading dock or a large storage area, with a bright light source visible in the distance, creating a horizon line.

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GREAT PLAINS

SEE FURTHER

E-Signature Standards Battles Are Looming

Digital signature disagreements could hobble U.S., overseas efforts

BY PATRICK THIBODEAU
WASHINGTON

A U.S. SENATE commerce subcommittee was told last week that the marketplace, not government, should determine e-commerce and Internet standards, lest it risk slowing the growth of the medium.

The message, delivered by Bentonville, Ark.-based Wal-Mart Stores Inc., Cupertino, Calif.-based industry trade group CommerceNet and others invited to testify, wasn't unexpected or markedly different from Clinton administration policies.

But the standards issues are nonetheless a controversy in the U.S. and abroad, and the Commerce Committee is ex-

ploring potential problems.

For instance, the Democrats and Republicans in the U.S. House of Representatives last

JUST THE FACTS

Outlook on Standards

Who's in charge? Clinton administration officials say private industry and standards bodies should guide Internet development.

What's the problem? Not all foreign governments share the U.S. point of view. Some want government-mandated technical and regulatory standards.

Looming battleground: Digital signatures. The U.S. is pushing for technology-neutral electronic-signature standards. Some other nations may set their own standards.

week attempted to resolve differences over a bill that business supporters say is essential to e-commerce: a national electronic-signatures standard.

The Electronic Signature in Global and National Commerce Act, or E-Sign bill, sponsored by House Commerce Committee Chairman Tom Bliley (R-Va.), would set a national standard for electronic signatures and put them on legal par with written signatures.

Businesses say they need a consistent national standard to conduct transactions across state lines.

But the E-Sign bill has raised concerns of consumer groups and some legal experts, who urged the House last week to defeat it. They said the bill would authorize businesses to replace paper records, such as warranties, with electronic records, regardless of whether the consumer has a computer.

Overseas, the U.S. may soon be fighting a standards battle over electronic signatures.

The European Union is considering electronic-signature legislation that, unlike the proposal in Congress, may not be technologically neutral and could "skew the international market in a way that will hurt U.S. companies," Andrew Pincus, the Department of Commerce general counsel, told the Senate Commerce Committee.

U.S. business representatives, such as Glenn Habern, senior vice president for new business development at Wal-Mart, may have been preaching to the choir at last week's hearing. But if the Clinton administration's concerns are any indication, it's a message that will need to be heard

beyond these shores.

"We do not believe that regulations are needed in the e-commerce space to enable its growth," said Habern, who warned a subcommittee that regulations could "freeze" the progress.

"Government should not try to force standards on industry artificially, but should continue to permit the marketplace to determine what standards should evolve and at what pace," Habern said.

The lack of interference by government in setting standards has helped the Internet grow, said Sen. Conrad Burns (R-Mont.).

"It continues to grow because government hasn't figured out how to tax it or how to regulate it," Burns said. ▀

Linux Server Cluster Threatens Open Unity

BY DAVID ORENSTEIN

The release last week of TurboLinux Inc.'s server clustering software raised concerns about whether the Linux community can prevent a divergence of versions — or forking — when vendors start making unilateral changes in the open operating system's kernel.

Linux's General Public License, which requires changes to Linux to be shared freely with the public, allows Linux to easily include unilateral innovations. But commercial versions of Unix have substantially diverged because their closed-source, proprietary licenses allow each vendor to compete on the basis of unique technological differences.

TurboLinux's software, TurboCluster, isn't the only Linux clustering effort, so there's no guarantee the Linux world will adopt its changes to the kernel. If competing software ends up in the mainstream kernel instead, it would be a fork, albeit a minor one, observers said.

Brisbane, Calif.-based TurboLinux's release is about six to eight months ahead of its competitors, according to analyst George Weiss at Gartner Group Inc. in Stamford, Conn. But TurboLinux took the risk of forking, he said, when it decided to differentiate its distribution of Linux based on core technology, rather than higher-level applications or marketing. If it avoids that pitfall, he said, TurboLinux's gamble that users want Linux to scale to Unix-like heights of performance could succeed. "They have a shot at it," Weiss said.

TurboLinux's software was beta-tested by hundreds of users, including FDX Corp. in Memphis. FDX has acknowledged its role as a tester but hasn't commented on how the software performed or how it might use Linux clusters.

Joel Sloan, a systems administrator at Toyota Motor Sales USA Inc. in Torrance, Calif., said TurboLinux has dim prospects. "I would hesitate to

jump on board the TurboLinux bandwagon, since we know that [Red Hat Software Inc.] will have the same sort of clustering solution in a few months' time and the community at large will gravitate toward the more open, more mainstream solution.

"I predict that the TurboLinux solution will eventually be forgotten, unless their enhancements are folded back into the mainstream Linux code base. I would like to continue to see one mainstream Linux kernel," Sloan said.

According to analyst Tony Iams at D.H. Brown & Associates Inc. in Port Chester, N.Y., Linux creator and kernel arbiter Linus Torvalds should take TurboLinux's changes seriously because high-availability clustering has been a major weakness of Linux.

There is precedent for Torvalds quickly deciding to incorporate changes to the kernel produced by commercial developers, Iams said. ▀

Wireless at Cable Speed On the Way?

Consortium looks to standardize connectivity

BY JAMES COPE

An initiative announced last week by a consortium of 11 companies aims to standardize technologies for broadband wireless communications, enabling wireless internetworking services at cabled speeds.

Included in the group are vendors that specialize in network hardware, circuit design, wireless connectivity and

systems integration.

An early rollout of systems based on the standard is expected within a year. It will initially target midsize and small businesses and remote sites that lack or have problems with high-speed wired connections to the Internet, the consortium reported.

Analyst Eric Rasmussen at TeleChoice Inc. in Denver said, "A standard for broadband wireless is really needed. Look at [Digital Subscriber Line] — it's been around for 10 years, but because of a lack of standards, it's just now taking off."

According to Cisco Systems Inc., the lead company in the group, the wireless technology supported by the consortium is based on Orthogonal Frequency Division Multiplexing. The technology can support wireless data speeds of about 10M bit/sec. downstream and 2M bit/sec. upstream, and eventually may scale higher.

A key working proposition of the group is to forge a standard that's open to all internetworking vendors. In theory, this will generate multivendor support, ensure interoperability and minimize user costs, according to the consortium.

The physical deployment of broadband transmission points isn't much different from cellular, according to Motorola Inc., the wireless leader in the consortium. A single tower site can cover a 30-mile radius. In many cases, cellular towers can be used for the broadband wireless antennae. ▀

In the Band

Participants in the Broadband Wireless Consortium

- Bechtel Telecommunications
- Motorola
- Broadcom
- Pace Micro Technology
- Cisco
- Samsung Electronics
- Electronic Data Systems
- Texas Instruments
- KPMG Consulting
- Toshiba America
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BRIEFS

NCR Cuts Staff

NCR Corp. said it would cut 1,500 jobs and take up to a \$250 million charge as part of an accelerated effort to exit the computer hardware business. The Dayton, Ohio-based vendor will focus on supplying business software for automated teller machines, retail store automation and data warehousing.

Baan to Unveil New Integration Tools

Baan Co. confirmed that technology for integrating its enterprise resource planning system and other software acquired in recent years will be announced at a user conference in Vienna next week [News, Oct. 11]. The Netherlands-based vendor said it will announce two new supply-chain management tools this week.

Bank Gets E-Wallet

First National Bank of Omaha in Nebraska has announced plans to introduce an electronic "wallet" for processing electronic checks for Internet bill payment and presentment. First National plans to use Los Angeles-based CyberCash Inc.'s InstaBuy Agile Wallet platform to load and manage payment information for billers.

Microsoft Exec Leaves

Brad Silverberg, an on-again, off-again executive at Microsoft Corp., quit the company last week. Silverberg took a two-year leave of absence in June 1997; he returned last spring as a part-time co-leader of Microsoft's Internet unit. Microsoft has since hired Rick Belluzzo, formerly CEO of Silicon Graphics Inc.

Short Takes

RED HAT SOFTWARE INC. in Research Triangle Park, N.C., said last week that its Linux version will be bundled with **INTEL CORP.**'s server platforms for Internet providers. . . . **CONEXANT SYSTEMS INC.** won a patent infringement suit filed by **KLAUS HOLTZ** and **OMNI DIMENSIONAL NETWORKS** that claimed Holtz held the original patent on the V.42bis modem data compression standard.

Plants Try to Align Sales, Production

Manufacturers start cross-function plans using IT; users hunt for new software tools

BY CRAIG STEDMAN
NEW ORLEANS

WHEN marketing planners at The Quaker Oats Co. plot out new products and promotions, supply-chain managers are right beside them to help assess the potential impact on manufacturing operations. Other big manufacturers such as Merck & Co. and Procter & Gamble Co. have executives from multiple departments meet monthly to synchronize their sales forecasts and production plans.

The goal, said attendees at last week's APICS '99 conference of production planners and other end users, is to use technology to do cross-functional planning that prevents business gaffes such as cost overruns and shipment delays.

There are complicating factors, among them a lack of packaged software that can do the kind of statistical forecasting and graphical analysis required by users.

But not making the effort to synchronize planning between manufacturing and other parts of a company can have unpleasant consequences.

For example, manufacturing managers at Lucent Technologies Inc.'s semiconductor division didn't have much involvement in the planning process when the company designed a device for a customer that was building an undersea networking system, said Richard Frisby, a business analyst at the Lucent unit in Allentown, Pa.

As a result, training issues and required plant-floor changes weren't taken into account, contributing to a six-month product delay.

"We missed a lot of stuff up front, and it caused us to fall behind the curve rather quickly," Frisby said.

Because of the lack of pack-

aged software, the companies that are doing cross-functional planning often have to resort to homegrown technology, users and analysts said.

Cincinnati-based Procter & Gamble has installed SAP AG's R/3 applications at many of its operations. But Walt Pietrak, a manufacturing process manager at the consumer products manufacturer, said the company has to move supply and demand data into spreadsheets for analysis by end users.

Quaker Oats also pulls data out of a variety of homegrown

and packaged systems and puts the information in spreadsheets, said Karen Alber, director of business solutions at the Chicago-based food processor.

Merck wrote a Web-based application that lets users view sales, inventory and finance information stored in a corpo-

rate data warehouse, said Reid Graves, manager of global manufacturing business processes at the pharmaceuticals maker in Whitehouse Station, N.J.

But it may be easier to put the required technology in place than it is to convince departments and business units to go along with the idea.

For example, it took Procter & Gamble nearly three years to set up joint sales and operations planning processes for the company's 19 operating divisions in North America, Pietrak said. "This has to be a top-down project," he added. ▀

On the Same Page

Synchronizing supply-chain plans with sales forecasts can help manufacturers avoid these problems:

- Rushed changeovers and setups of production lines
- Manufacturing delays because of a lack of special parts
- Buildup of excess product inventories
- Expedited shipments that raise transportation costs
- The need to run extra shifts that require overtime pay

Users Welcome Lotus Raven

Knowledge to work with Domino server

BY DOMINIQUE DECKMYN

Lotus Development Corp. last week at its Lotusphere Europe '99 event in Berlin announced a knowledge management suite code-named Raven and outlined plans to offer Domino customers unified messaging and wireless access.

Raven, which is scheduled to ship in mid-2000, will provide an infrastructure for knowledge management. It won't require Lotus Domino,

but it will integrate with it.

That integration plays well with some Domino users. "If you're trying to sell knowledge management up the chain, it's nice to say there's this single tool kit and it fits into our existing infrastructure, rather than have to say we have to piece something together," said Ken Schweda, a developer at commercial printing company R. R. Donnelley & Sons Co. in Downers Grove, Ill.

Lotus also discussed plans for unified messaging and wireless access. The IBM subsidiary is joining Kirkland, Wash.-based AVT Corp. to offer a unified messaging system that will include a Compaq Computer Corp. server. Pricing wasn't announced, but AVT's software is priced at \$100 to \$250 per seat.

"Lotus got a little behind in this business when Microsoft [Corp.'s Exchange] was chosen as the platform by some very visible players like Lucent [Technologies Inc.] and Active Voice [Corp.]," said Sara Radicati, president of Radicati Group Inc., a research firm in Palo Alto, Calif.

Linking with AVT lets Lotus

offer a system that is easy to set up, but it does so at the risk of antagonizing other unified messaging vendors, Radicati said. However, unified messaging isn't a high priority for most corporations, she added.

Customers Interested

Users are showing more interest in wireless access to e-mail and other Domino services. At Lotusphere, Lotus announced the shipment of Mobile Services for Domino 1.0, a \$3,999-per-server add-on that lets end users send and receive messages from mobile devices, including pagers and cellular phones. Lotus said it will work with Nokia Corp. to develop Wireless Access Protocol technology for Domino.

Eric Johnson, director of technical services at United Behavioral Health, a division of United Health Group Corp. in Minneapolis, said an increasing number of employees are using handheld devices such as 3Com Corp.'s Palm VII. Accessing Notes e-mail and a corporate address book on Domino from these devices "would be the next step," he said.

Also, Lotus released a developer's tool called Enterprise Solution Builder and said it will ship Domino Release 5 for Linux within 30 days. ▀

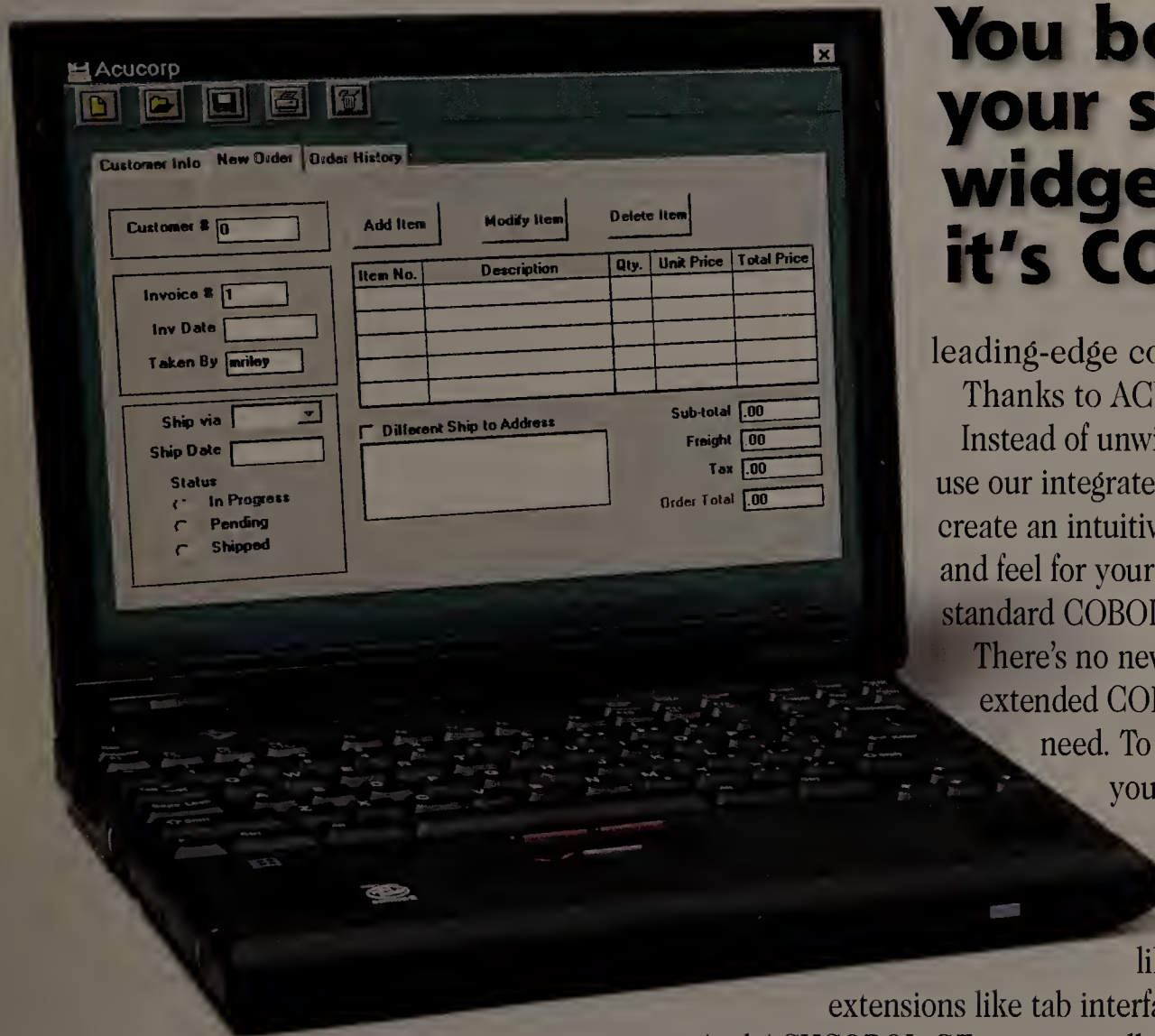
What About Raven?

Lotus' knowledge management platform, due in mid-2000, will consist of:

Knowledge portal: Browser interface, includes knowledge resources

Discovery engine: Contains Content Catalog (categorizes documents) and Expertise Locator (helps locate experts inside the company)

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CA Offers Online Sales Via Intraware

Online shopping beckons systems management software buyers

BY SAMI LAIS

COMPUTER Associates International Inc. last week announced an agreement with Intraware Inc. to sell and deliver CA software over the Internet.

Intraware, in Orinda, Calif., will resell CA's Workgroup and Advanced Edition products. Any price breaks CA offers its customers, such as its recent drop in OS/390 application pricing, is immediately reflected in the reseller's price, said Richard Bacigalupi, Intraware's business development manager for strategic partnerships.

Intraware's all-online business model and its access to midmarket businesses were the major draws in establishing the relationship, said Gayle Kemper, a senior vice president at Islandia, N.Y.-based CA.

Intraware's Web site also offers software made by companies like Novell Inc., Netscape Communications Corp. and Informix Corp.

Intraware processes the sale,

issues a license number and delivers the software, said an Intraware spokesman.

The speed of such transactions appeals to David Widjaja, an MCI WorldCom Inc. technical consultant at Metamor Worldwide Inc. in Raleigh, N.C.

Time-Saver

In his first purchase using Intraware, he said, Widjaja bought software from Informix in Menlo Park, Calif. Buying directly from Informix takes up to a week, he said. But when you buy from Intraware, "you go to the Web site, get your credit card out and you get it, boom, 15 minutes later," he said.

Potential buyers who have "Silver" or "Gold" service agreements with Intraware can go to the Intraware Web site and compare products using Intraware's Compariscope software.

Andrew Dinsdale, manager of Internet services for automotive industry marketing

company The Phoenix Group in Farmington Hills, Mich., uses Compariscope to review much of the Internet-based software he buys.

Gartner Group Inc. in Stamford, Conn., "tells me who the main players in the market are, and then Compariscope takes a deeper dive into the functionality," Dinsdale said.

Intraware may be unique now, but not for long, said Mitchell Kramer, an analyst at Patricia Seybold Group in Boston. The online model is an extension of the model for successful mail order houses such as Marlow, N.H.-based PC Connection, he said, and "they're springing up like wildflowers in the spring." ▀

Intraware Sells CA Software Online

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IBM, Siebel Put Oracle On Defensive

Deal pushes CRM on DB2 database

BY ROBIN ROBINSON

IBM and Siebel Systems Inc. are tightening the global relationship among their sales, integration and support teams at the expense of Oracle Corp.

The companies announced last week that Siebel has defined IBM's DB2 Universal Database as the database of choice for the company's customer relationship management (CRM) application suite. IBM will begin global support for the suite this week, and the companies will jointly market the database and CRM package.

Siebel, in San Mateo, Calif., has more than half of the \$2.2 billion worldwide CRM market, due in part to recent acquisitions. Since Siebel emerged as the market leader a couple of years ago, it has seen other entrants to the CRM space, including Oracle, which has repackaged its Front Office suite of applications into a CRM offering.

"It shows Siebel is trying as much as possible to drive business away from Oracle's backend database. Siebel wants to take cash away from Oracle, and IBM's willing to take it," said analyst Sam Clark at Meta Group Inc. in Stamford, Conn.

Although there's no direct correlation between the health of Oracle's database and CRM business segments, the areas can cross-pollinate, he said, "and Siebel would rather not put money in Oracle's pocket if they can help it."

By combining their marketing efforts, integrating support and tightening the integration between IBM's database and Siebel's application suite, Siebel CEO Tom Siebel said he hopes to "establish a standard for CRM to which all others will conform."

The companies intend to focus on the communications, insurance, financial services and consumer packaged goods industries. ▀

Portal Provides One-Stop Monitoring for Managers

Lucent enables customizable views

BY SAMI LAIS

A Web portal version of Lucent Technologies Inc.'s VitalSuite enterprise performance management software, released today, gives business and information technology managers individually customized reports on system and application performance.

Version 7.0 brings together access to any combination of business and technical views on a single site, accessible via Web browser.

Beta user John Herrera, senior director of global networks and operations at storage vendor EMC Corp. in Hopkinton, Mass., checks his page "pretty much daily," he said. Most VitalSuite users at EMC are technical staff, he said, although "reports on network availability go to a subset of business managers."

Herrera said he runs the VitalSuite beta, "especially for the remote access analysis

tools. That's always a nasty job."

For Thomas R. Fitzmaurice Jr., a program manager at enterprise network carrier Convergent Communications Inc. in Atlanta, Web access played a backseat role to the performance monitor. "It's slick stuff," he said.

A team came in to demonstrate the product one morning, he said, "and by lunchtime, they're showing overhead images, and they say, 'That's your data; we snipped your data.' And I'm saying, 'Holy buckets.'" Convergent uses the software internally and plans to market its use to its customers, he said.

The software "analyzes both the network infrastructure and the applications riding on it — both homegrown and commercial," said Theo Forbath, director of Northeast Consulting Resources Inc. in Boston.

Pricing for VitalSuite 7.0 begins at \$44,000, and a typical enterprise installation of the full suite begins at about \$250,000. ▀

Microsoft Coaxes Internet Outsourcers to Use NT

BY KIM S. NASH

Microsoft Corp. wants Internet service providers and other online hosts to use Windows NT — and the forthcoming Windows 2000 — for application hosting services and last week announced deals with Cisco Systems Inc. and other vendors toward that goal.

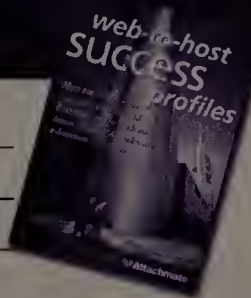
Many Internet service providers use Unix, which some contend better handles high-volume user loads. But coaxing online providers to use Windows NT would give subscribers easier access to Microsoft applications that run on the operating system.

Microsoft and Cisco said they will offer software, hardware and networking products to service providers that want to offer application hosting to end-user companies. The two said they are working with Clarus Corp., Great Plains Software Inc. and Pivotal Corp. to build kits that include sales guides, demonstrations and white papers aimed at getting users to sign up for such services.

The application hosting market is expected to reach \$2.7 billion this year, up from \$889 million last year, according to Dataquest, a market research arm of Gartner Group Inc. ▀

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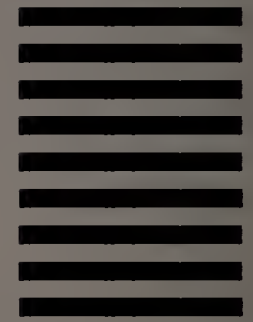
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Insurance Giant Puts Windows 2000 to the Test

Travelers joins Joint Development Program

TRAVELERS Insurance Co. in Hartford, Conn., sees a strategic need for Windows 2000 and has joined Microsoft Corp.'s Joint Development Program (JDP) to learn the most it can about the technology.

For a company like Travelers, which has 23,000 users and 1,500 servers in the property and casualty and life insurance units, application incompatibility and a low return on installing Windows 2000 would be major roadblocks to adopting it.

Recently, property and casualty CIO **Diana Beecher**, distributed environments director **Walt Zilahy** and Windows 2000 project leader **Dave Croweak** discussed these issues with *Computerworld* senior writer David Orenstein.

Q: What value do you expect to derive from Windows 2000?

Beecher: The reason ... has to do with implementing a mature and easily managed [Lightweight Directory Access Protocol (LDAP)] directory as the centerpiece to our network environment. To come up with a concrete answer to that question — "Is Microsoft's LDAP implementation sound?" — it seemed like joining the JDP

was a very good way [to find out].

Zilahy: We're really concerned about having a secure environment for e-commerce, which we're getting into in a big way. With that directory infrastructure in place, we can really lock down the environment much tighter than we can with our current NT 4.0.

Beecher: For a lower administrative cost.

Q: Is this going to be a companywide rollout?

Beecher: We have a ... pilot implementation which concerns fully implementing two of our branch offices where we actually write policies and process claims. Then [we will] get more experience and see how it works and do some

more analysis about realizing the benefits. We don't want to just throw it out there.

Q: You tested the compatibility of applications under Windows 2000 with the help of Microsoft employees in a "SWAT" team. How did that go?

Croweak: We tested about 80 applications that ranged from third-party products to home-grown things, and we had a 95% [compatibility] ratio in some of the early Release Candidate 1 code.

Zilahy: That is, 95% ran perfectly right out of the box, without

any glitches at all. Glitches had to do with old 16-bit code and third-party products that we haven't kept up-to-date.

Croweak: For the issues that did arise, we either were provided work-arounds from Microsoft or bug fixes in subsequent releases of the code.

Q: How did the SWAT teams work?

Croweak: They sent a team

[with] a SWAT team leader and six other developers from the lab themselves. We partnered key applications people — testers, developers, etc. — with two Microsoft developers [in each of three lines of business]. Diana invested heavily in making sure that we had ... production look-alike environments where we exercised the code.

Beecher: We used scripts of business transactions that are representative of the activity that goes on, and it's the same set of comprehensive scripts that we use to do regression testing when we change the applications.

Zilahy: The SWAT team did have access to source code, and they could put a change into a module and bring it right down and install it here. And they did that in a couple of cases. ▀

MORE THIS ISSUE

Software filters prevent other people's bad Y2K data from getting into your systems. See page 38.

GM Steers Drivers Onto the Internet

Web access in cars to be voice-activated

BY LEE COPELAND

General Motors Corp. will try to steer new car buyers onto the information superhighway by offering Internet access in some vehicles by next year.

GM is expected to display a Cadillac Seville with voice-activated Web services at the Special Equipment Market Association automotive trade show in Las Vegas this week. The Cadillac will sport a hands-free, voice-activated system that offers drivers the option to check e-mail, download data and casually surf the Web.

According to published reports, the Web system will integrate with GM's Onstar cellular communications and Global Positioning Satellite technology. Subscribing GM customers will receive around-the-clock emergency services from the Onstar call center and optional perks.

Detroit-based GM recently formed an electronic-GM unit to handle this and other Web initiatives, company officials said. However, the company declined to provide specifics.

"GM already has the technology in place for Web surfing with Onstar, but there are other technology hurdles," explained analyst James McQuivey at Forrester Research Inc. in Cambridge, Mass. "GM will need to nail the voice-activation technology before peo-

ple will use it. The trick is the trade-off between perfect voice recognition at a high cost or limited recognition if the context is limited."

McQuivey said modifying Web content to handle voice-command searches and increasing cellular phone bandwidth will also need to be addressed for motor-bound Web surfing to take off.

Gordon Hard, senior automotive editor at *Consumer Reports* in Yonkers, N.Y., questioned the logic of pairing Web surfing with Cadillac car buyers and driving.

"Cadillac is stuck with an older demographic that typically has enough money for a system like Onstar but are not usually early adopters of new technology," said Hard. ▀

FDX Allies With 'Big 5' Firm

BY CHRISTINE MCGEEVER

FDX Corp., the Memphis-based parent company of Federal Express Corp. and Viking Freight Inc., last week formed a supply-chain alliance with New York-based consulting firm KPMG LLP, in which each company will offer the other's information technology products and services.

Though the alliance is initially targeting 500 to 700 existing customers of the two companies, the supply-chain application services could eventually be made available to anyone with a Web browser.

The long-term potential to provide outsourced supply-chain applications is the most important aspect of the agreement, according to one analyst. "FDX already provides these services in SAP through Web browsers," said Tom Fontanella at Boston-based AMR Research Inc. "FDX will probably take it down-market to folks who don't need to outsource

full supply-chain management but may only need an icon on the desktop to help them find a carrier, a supplier, the best rates or a distributor."

Fontanella said the agreement apparently doesn't force potential users to rely solely on FDX transport services. "The question is whether nonaffiliated parties will want to provide business information to FDX, or whether FDX will try to wean the customer off the nonaffiliated carrier," he said.

Tom Schmitt, a corporate vice president at FDX, concurred. "FDX is looking for integrators who know how to integrate non-FDX technologies in particular," he said. "The alliance is a response to customers telling us they are tired of dealing with 50 different technical-support suppliers."

An immediate result of the alliance is the addition of FDX products and services to KPMG's database of services and products, Schmitt said. ▀

SNAPSHOT

Recent Earnings Announcements

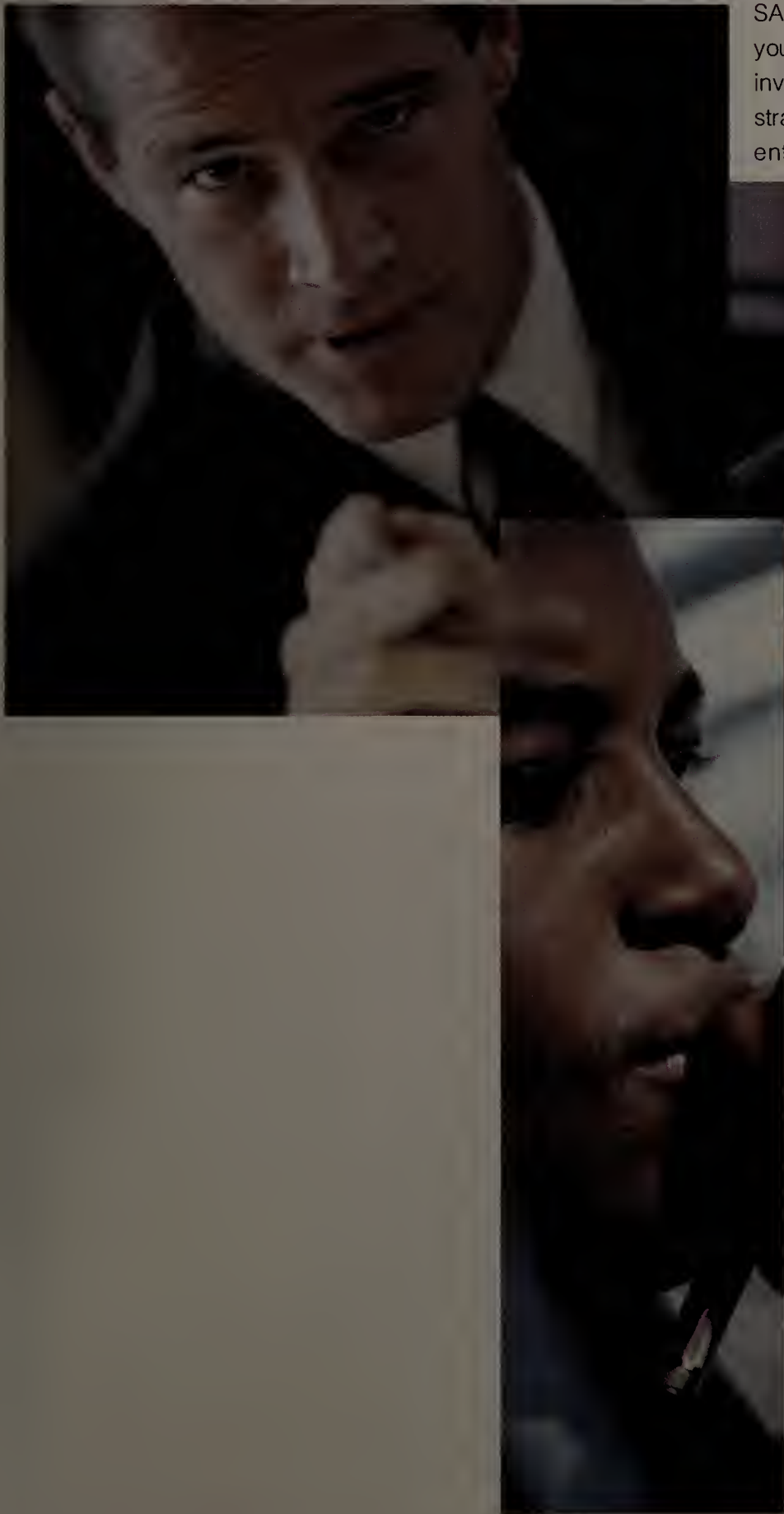
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| Lucent | \$10.58B | \$8.57B | \$948M | \$972M |
| Network Associates | \$195M | \$242M | (\$241,000) | (\$14.4M) |
| Nortel Networks | \$5.3B | \$4.14B | \$8M | (\$181M) |
| Symantec | \$182.5M | \$130M | \$25.8M | \$1.9M |

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COMMUNICATIONS

EDS, MCI WorldCom Sign Outsourcing Pact

Deal could add technical, network hurdles to MCI/Sprint merger plans, analyst says

BY DOMINIQUE DECKMYN

AFTER MONTHS of wrestling with the details, Electronic Data Systems Corp. and MCI WorldCom Inc. announced last week that they finally signed their \$12.4 billion dual outsourcing deal, putting to rest rumors that the deal was just too complex to ever get done.

But one analyst suggested the deal might complicate the proposed merger of MCI

WorldCom with Sprint Corp.

"I don't think the end result was ever in doubt," said John Sidgmore, vice chairman of MCI WorldCom. "Those comments were made by analysts who were just speculating." He also said EDS executives had been quoted out of context.

The huge 10-year, two-way outsourcing deal was announced in February and expected to be finalized by May. It included plans for EDS to buy MCI WorldCom's infor-

mation technology services arm, MCI Systemhouse, for \$1.65 billion.

MCI WorldCom will outsource part of its IT operations to EDS Feb. 4 in a \$6.4 billion arrangement. EDS will outsource part of its global network operations by year's end for approximately \$6 billion. About 1,000 EDS employees will transfer to MCI WorldCom, and 1,300 MCI workers

will move to EDS.

Dan Zadorozny, client executive for MCI WorldCom at EDS, said the deal turned out to be more complex than originally anticipated. It now includes 15 IT locations; about 2,500 midrange systems, including systems from Hewlett-Packard Co., Sun Microsystems Inc., the former Digital Equipment Corp. and others; and 18,000 mainframe MIPS of processing power.

Dean Davison, an analyst at Meta Group Inc. in Los Angeles, said the complexity of the deal is likely to cause difficulties down the road. He also said the outsourcing arrangement might complicate the

possible merger of IT systems between Sprint and MCI WorldCom. "It adds a third variable" to the equation, said Davison.

But Sidgmore said the Sprint acquisition could give EDS an added incentive to deliver a competitive service in order to win a larger part of the IT operations of the merged companies. Sidgmore said that even without Sprint, MCI WorldCom was handing over less than 50% of its business applications to EDS.

"So they will have to be very competitive if they want more of our business," said Sidgmore. "I think that's important in a 10-year agreement." ▀

Survey: Spam Rules Favored

BY DOMINIQUE DECKMYN

A new report has found that Internet users object strongly to unsolicited commercial e-mail, or spam, and a majority would support antispam legislation.

In the survey, conducted by Mountain View, Calif.-based market research firm Survey.com Inc., 70% of the respondents said they dislike receiving e-mail from companies they don't do business with, and 81% said they object to receiving e-mail from companies they don't know.

Not unexpectedly, more than 86% of those surveyed expressed dislike of e-mail selling pornography, but even more — 95.5% — said they object to companies that use false addresses to avoid replies.

"It's becoming worse," said Haseen Alam, director of in-

formation technology at Johnson Brothers Liquor Co. in St. Paul, Minn. Spam is taking up bandwidth and storage space, not to mention employees' time. For those reasons, Alam plans to install a spam filtering tool in the next few weeks.

Some Tolerance

Respondents said they're more tolerant of e-mail from companies they know and already do business with — just over 50% expressed a positive attitude toward such e-mail. But Internet users are apparently ready to go out of their way to avoid spam — 35% said they opened alternate e-mail addresses for this reason.

The survey was funded by the Coalition Against Unsolicited Commercial E-mail (CAUCE), an antispam pressure group. CAUCE has spoken out in favor of the Can Spam Act, introduced this year by Rep. Gary Miller (R-Calif.).

Joseph Fuller, director of operations for electronic media at Trader Publishing Co. in Norfolk, Va., said he receives 20 to 30 unsolicited e-mails per day. "I see it growing all the time," said Fuller. The time it takes employees to wade through spam in their in-boxes is "a growing concern." ▀

BMC plan tailors existing network products for the Net

BY SAMI LAIS
NEW YORK

BMC Software Inc. has staked its claim in the burgeoning e-commerce market, announcing forthcoming versions of its flagship products and services tailored to the back-office operations of electronic businesses.

The Houston-based company's e-commerce initiative, called the Service Assessment Center for E-business, was announced earlier this month. It involves its Professional Services division and its network and application management tools, Patrol for E-business Management and Mainview for E-business Management.

The new versions will have features specific to e-commerce applications. For example, the new Java Applet Response Time Analyzer monitors the response time of a user transaction on a Web page, and a packet decoder looks into the HTTP packets to determine whether transactions were completed.

The tools don't represent so much a new direction as an extension of existing product capabilities from the in-house network to the Web. "That was our intention," said Max Watson, BMC president and CEO.

"From a management perspective, the move to e-busi-

BMC Software Goes to the Web

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- **Patrol for Firewalls:** Firewall monitoring and management
- **Patrol for Microsoft Site Server, Commerce Edition:** Web application server management

MAINVIEW FOR E-BUSINESS MANAGEMENT

- **Mainview for [IBM] WebSphere:** Web application server management, site use analysis, IBM DB2 management and monitoring
- **Mainview for Network Management:** IBM OS/390 application availability monitoring
- **Mainview for Systems Management:** OS/390 subsystem monitor

ness does not represent a technology shift" in the way that the shift from mainframe to client/server did, said Ray Paquet, an analyst at Gartner Group Inc. in Stamford, Conn. But it should represent a shift in how people think about the roles of business and information technology in meeting goals, he said.

"What we're looking for is the network as a utility," said John C. Charters, CEO of application service provider Qwest Cyber.Solutions LLC in Denver.

The two companies are working out a deal in which each will be both supplier and customer to the other. Cyber.Solutions will host SAP applications for BMC, and BMC plans to supply electronic business tools to

Cyber.Solutions.

James M. Lidestri, president of application service provider Interliant Inc. in Purchase, N.Y., said he plans to beta-test BMC's electronic business suite and work with the company to develop more services.

Before deciding on BMC, "we contacted other vendors, but, frankly, they didn't seem all that interested in talking to us," Lidestri said. "BMC came in and said, 'What problem do you need to solve?'"

Beta testing begins next month. Commercial products should be available by March, priced from \$2,000, BMC said. Patrol components tailored to manage Web application servers are scheduled to follow in coming months. ▀

JUST THE FACTS

Like Spam?

Selected results of an online survey of 1,200 Internet users:

76% think spam should be regulated by the government in some way

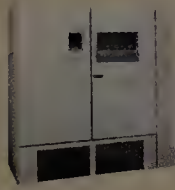
64.5% delete spam without reading it

On average, they said they receive 24.11 e-mail messages per day and consider 39% of them to be spam

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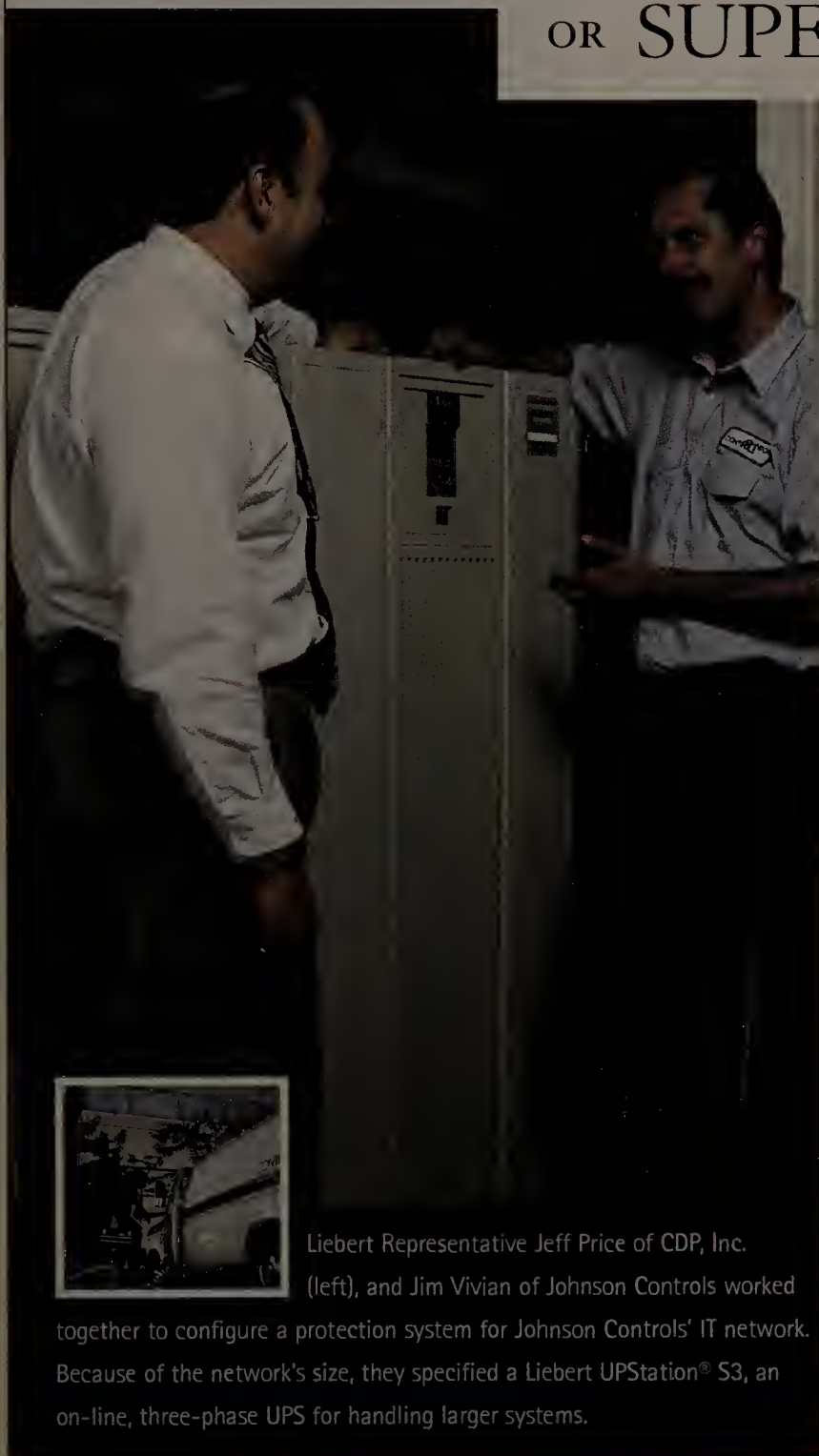


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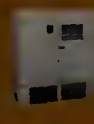
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Unisys Sells E-Services

Apps, devices and consulting target vertical industries

BY THOMAS HOFFMAN
NEW YORK

USING AN old bank as a backdrop, Blue Bell, Pa.-based Unisys Corp. last week introduced a set of end-to-end services and applications designed to help organizations dive into the emerging business-to-business e-commerce market.

The announcement, made in the marble-tiled lobby of the former Bowery Savings Bank, included the unveiling of a set of 60 services, vertical industry-oriented applications and network devices.

Even though Unisys "is a little late" to the business-to-business e-commerce space, as one Wall Street analyst put it, many customers who were in attendance said the company's focus on delivering Windows-based prod-

ucts and services is right on target.

For example, one of the key products Unisys introduced was a Windows- and Intel processor-based data center server that can be partitioned to support back-office processing, post front-end applications and support a variety of operating environments all at once, including Windows NT and Unix.

That type of multiserver in a box appeals to customers like Sachi Shankar, director of application development at Liberty Travel. The Ramsey, N.J.-based travel service (www.libertytravel.com) plans to put its reservations system online. It is also "looking for additional channels to market our services, and we think there could be a real fit with Unisys," said Shankar.

Although Unisys introduced a set of vertical industry applications — such

as application service provider services for community newspaper publishers — it was the dynamic partitioning of its ES7000 machine that seemed to capture most of the customer interest.

"It's great to see a Wintel machine that can perform like a mainframe but at a fraction of the price," said John Hick-

ey, chief technology officer at the Nasdaq Stock Market Inc. in Trumbull, Conn.

Users said they're impressed by Unisys' vertical industry knowledge. "They really understand our environment and the nature of being a government agency," said Tony West, manager of special projects at the Land Transport Safety Authority, New Zealand's equivalent of the U.S. Department of Transportation. ▀

DB2 Billed as Web App Cornerstone

IBM exec cites portal plans for database

IBM, hoping to cash in on its mainframe heritage, is pitching its DB2 database as a fundamental building block for e-commerce applications. The company claims that most of the 3,000 users of its Net.Commerce e-commerce technology base their applications on DB2, while Oracle Corp.'s database is No. 2.

Computerworld senior editor Jaikumar Vijayan spoke with Janet R. Perna, general manager of database management at IBM's software group, about the DB2/e-commerce connection.

On why IBM's mainframe legacy is a good thing in the world of e-commerce:

Things like reliability, availability and scalability have come back to the forefront. We have all seen the effect of outages on companies like eBay [Inc.]. We are taking the same reliability we established in the mainframe world and applying it to open systems.

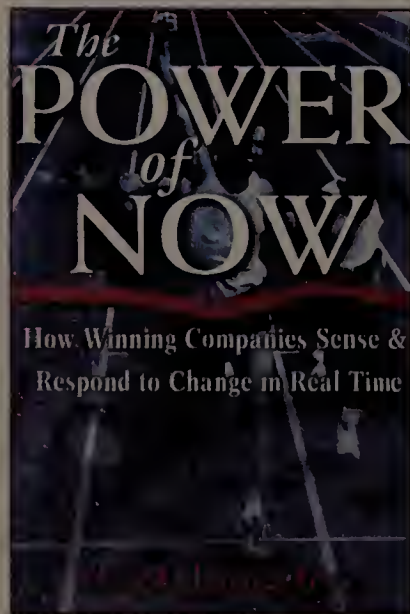
On how highly scalable e-commerce applications are affecting database design:

The database has to match the hardware architecture it is running on. If you look at Intel [Corp.], Sun [Microsystems Inc.] or IBM, they all have shared-nothing architectures [such as a cluster in which each machine has its own memory and disks]. The database has to be optimized to fit these architectures. That is why when you look at DB2 on Unix and NT, it has been designed to fit these shared-nothing architectures, [while] DB2 on the S/390 is a shared-disk architecture.

On IBM's current DB2-related investments:

We have kicked off a \$30 million campaign focused on business intelligence [technologies] as part of e-business. We launched new versions of things like Intelligent Miner and DB2 [online analytical processing] server [and] we had refreshes to our business intelligence tools in September. Before the end of the year, we will have an Enterprise Information Portal focused on the integration of all types of content in an enterprise. ▀

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Portals Gear Up for Holiday Season

BY JAIKUMAR VIJAYAN

Announcements from major portal sites last week may have been driven by predictions of a sharp increase in online shopping this holiday season.

Palo Alto, Calif.-based AltaVista Co. launched a network of online services called New AltaVista Network. It includes Shopping.com, an online shopping service with product reviews and online price comparisons.

Similarly, Waltham, Mass.-based Lycos Inc. launched LycoShop, where shoppers can research products and consult with others before placing online orders. Linked to the site are retailers such as Barnesandnoble.com LLC., Sharper Image Corp. and The Neiman Marcus Group Inc.

In a slightly different move, Redwood City, Calif.-based Excite@Home said it

will buy Blue Mountain Arts Publishing Co.'s electronic greeting-card site, BlueMountain.com, for \$788 million in stock.

Predictions of a doubling in Web-based sales this holiday season — from \$11.5 billion last year to \$24.2 billion this year — may be a primary motivator for these moves, said Emily Meehan, an analyst at The Yankee Group in Boston.

According to NPD Online Research, a Port Washington, N.Y.-based research firm, 68% of more than 4,500 people sampled in a Web poll claimed they would buy online this year, compared with 36% last holiday season.

"The major sites want to have their ducks in a row before the consumer buying season," Meehan said. "There is a significant amount to be gained by having your site all set up and the word out well before the shopping starts." ▀

Compaq Profits Up As Services Show Gains

Quarterly results show server sales also on the upswing while commercial PCs struggle

BY STACY COLLETT

COMPAQ COMPUTER Corp., showing a small but significant sign of new life after months of disappointing earnings, beat Wall Street expectations and posted third-quarter earnings of \$140 million, up 22% over the same quarter last year.

Its newly aligned enterprise server and solutions group, which sells PC servers, storage products, minicomputers and mainframes, posted impressive earnings, while its commercial PC unit continued a downward slide.

Total revenue for the quarter grew to \$9.2 billion, up 5% from \$8.79 billion in the same quarter a year ago. However, those results include a one-time gain of \$1.2 billion from the sale of a majority interest in AltaVista Co. to CMGI Inc.

The results also included restructuring and related charges of \$868 million, including layoffs of up to 8,000 employees.

"We set specific goals for the third quarter," said Michael

Capellas, Compaq's president and CEO, speaking to analysts in a teleconference Tuesday. "The company returned to profitability, aligned our businesses around competitive models and began to articulate a clear strategy."

In July, Compaq restructured itself into three units to better clarify its products. The enterprise solutions and services group pulled in revenue of \$4.9 billion, up 12% from the third quarter last year. The enterprise group represented 54% of Compaq's revenue in the third quarter. Revenue from the services portion grew 7% year over year to \$1.6 billion.

Revenue from Compaq's server products, including ProLiant, Alpha and Tandem high-availability Himalaya servers and other Unix-based products, grew 12%. Compaq's corporate PCs unit continued to struggle, with revenue declining 12% from the same quarter last year.

"The brand has suffered some in the business sector because of the management turn-

over and the view from the outside that things are a little bit shaky," said Bruce Stephen, an analyst at International Data Corp. (IDC) in Framingham, Mass.

Compaq continued to lose market share to rival Dell Computer Corp., which seized the lead from Compaq as its share of the U.S. market rose from 14% to 18% (see related ar-

ticle, this page), according to IDC sales estimates. Compaq's commercial PC shipments rose 24%, and its U.S. market share remained flat at 16%.

Market share losses could continue in the short term, said Jimmy Johnson, an analyst at A. G. Edwards & Sons Inc. in St. Louis, because Compaq has vowed to focus on profitability over market share. ▀

Q3 1999 U.S. PC Shipments

| VENDOR | SHIPMENTS | % GROWTH OVER Q3 1998 |
|---------------------|--------------|-----------------------|
| Dell | 1.996M | 56.5% |
| Compaq | 1.78M | 24.9% |
| Gateway | 1.09M | 40.1% |
| Hewlett-Packard | 955,000 | 19.4% |
| IBM | 890,000 | 5.3% |
| Others | 4.95M | 13% |
| TOTAL MARKET | 11.6M | 22.7% |

SOURCE: DATAQUEST, SAN JOSE

Web Uptime Needs Spur Sales

STACY COLLETT

The recent spate of Web site outages at Charles Schwab & Co. and Britannica.com underscores a growing demand for technology that manages the flow of Web content regardless of traffic volume. So it's no wonder companies and investors are drawn to a nascent but hot market for Internet content distribution services.

Web sites with heavy traffic or rich content sometimes experience slow-loading pages or even outages during peak traffic. Content distribution services are able to speed content on the Web by deploying servers closer to the end user and shortening the distance content needs to travel.

"It's going to be increasingly important for everybody to put your content out at the fringe of the network," said Steve Robins, an analyst at The Yankee Group in Boston.

Industry players Akamai Technologies Inc. and the newly merged Digital Island Inc. and Sandpiper Networks Inc. each have 1,200 servers in more than 21 countries. Akamai, in Cambridge, Mass., also links with 40 Internet provider networks. Sandpiper, in Thousand Oaks, Calif., maintains its own content delivery network.

Performance improvements can be significant. Akamai boasts transmission speeds that are two to six times faster than transmissions without the service, depending on traffic volume.

But observers said the real benefits are balanced traffic and greater reliability. "Considering the lifestyle nature of our brand, we must use compelling photography and quick speed to showcase our merchandise," said Brian Sugar, director of new media at clothing retailer J. Crew Group Inc. in New York.

Growing Popularity

While most industry analysts expect content distribution services to gain in popularity, they don't have exact figures on its market potential because the technology is relatively new. But the market is heating up.

Akamai was set for an initial public offering last Friday that promised to push the 18-month-old company's market capitalization to more than \$1 billion. Also, network services provider Digital Island and content delivery firm Sandpiper Networks announced a merger last week in a \$630 million stock swap. ▀

Dell Overtakes Compaq in PC Race

Dell Computer, long on Compaq's heels in the race for U.S. PC market share, finally surged past its rival in the third quarter with 56.5% growth in shipments to gain the No. 1 spot, according to Dataquest in San Jose (see chart).

Most observers credit Dell's direct sales model for the company's success, but there are some problems caused by the Round Rock, Texas-based company's phenomenal growth.

Giga Information Group Inc. reports it has received a "large number of complaints" about delivery of Dell PCs, largely because of the company's rapid growth.

"Every vendor in this space has spot quality problems and delivery problems because of shortages," said Rob Enderle, an analyst at Giga in Santa Clara, Calif. "Dell

has a higher requirement because they come in with this idea that they're going to come to you directly."

Other PC vendors are striving for similar sales models. No. 2 Compaq in May cut its distributor ranks by 70%.

"They brought their inventory down by half a week. They need to continue to streamline from the finished good to the customer," said Jimmy Johnson, an analyst at A. G. Edwards.

Johnson said No. 4 Hewlett-Packard Co. is also trying to go direct, but is moving "fairly slow."

Fifth-ranked IBM announced last month it would sell its Aptiva PCs direct in the U.S. market. "They're trying to go direct just like everybody else is," Enderle said.

- Stacy Collett

BRIEFS

Exodus Buys Site-Monitoring Firm

Web site host Exodus Communications Inc. last week announced it was acquiring Service Metrics Inc. for about \$280 million in stock. Service Metrics in Boulder, Colo., offers Internet monitoring applications and services to measure the availability and performance of Web sites. It will become a subsidiary of Exodus, in Santa Clara, Calif. The deal is expected to be finalized next month.

Cisco Purchases Net Caching Company

Cisco Systems Inc. announced last week that it would purchase Tasmania Network Systems Inc. for \$25 million in stock. Tasmania has a content-aware network caching technology that speeds delivery over the Web and enhances network performance. Cisco says it plans to use the technology in its Cache Engine 500 product series. Both companies are in San Jose.

GTE Sues AT&T, Others

Charging that the companies are using their economic muscle to limit customer choice, GTE Corp. last week filed an antitrust lawsuit against AT&T, Comcast and their affiliated Internet service provider, @Home. Comcast and AT&T Cable Services (previously TCI) require their customers to use @Home as an Internet provider if they want fast access over cable lines.

PSINet Revenue Up

Global internetworking provider PSINet Inc. last week announced third-quarter revenue of \$140.6 million, an increase of 108% over the same period last year. The Herndon, Va.-based company reported a net loss of \$87.7 million, compared with a loss of \$48.1 million for the same period the year before.

"[PSINet looks] like they're going to achieve a good data center build-out, increase their international presence and extend their reach with fiber," said David Willis, an analyst at Meta Group Inc. in Plano, Texas. "But they need to address customer service." ▀

MARYFRAN JOHNSON

Dot-com drainpipe

HEAR THAT LOUD sucking sound? No, no, it's not your life. It's the noise your top IT talent pool is making as it heads down the dot-com drain on its merry way to the most popular destination for corporate-weary technologists. There's certainly no staffing shortage over there

in the e-universe, is there?

But if you're assuming the driving force behind the start-up stampede is merely the whine of the '90s ("Everybody's getting rich but me!"), think again. For many technologists and IT execs, the allure goes beyond the bucks. After all, they realize that most Internet start-ups fizzle into failure long before an IPO can be launched.

What is so compelling is the chance to play a hands-on role in everything from evaluating technologies and shaping IT strategy to making a real difference in the life or death of the business. In one of our stories last week ["Hands-on Executives Flee for Web Start-ups," News, Oct. 25], PeoplePC Inc.'s new president — a former top executive at a telecom vendor — likened the sensation to conducting the orchestra while playing several instruments. Heady stuff, that.

For a deeper look at the dot-com phenomenon and its powerful draw for IT and business execs, read "IT on the Net Frontier," by Kathleen Melymuka, in this week's Business



MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

section (page 54). She spoke at length with CIOs and senior managers from Autobytel, ETrade, Toysmart and Wingspanbank about life behind the scenes at their dot-com IT organizations.

"Why torture myself?" you're thinking. "I can't turn my company into a Net start-up." Ah, but you can borrow some great ideas for crafting your own e-commerce strategies. Check out how Toysmart.com, for instance, has quality assurance engineers sit with developers and test new system segments as soon as they're ready — rather than waiting for all the pieces of a project to be finished. Enterprise testing consequently moves much more quickly.

Perhaps the greatest lesson traditional companies can learn from their e-brethren is that "the Internet isn't just for customers," as Autobytel COO Ann Delligatta told our reporter. "You can use it to run your whole business better," she pointed out.

What better way to bring your IT talent home again? ▀

DON TAPSCOTT

Customer woes: The new big Internet industry

IN THE GOOD old days, an unhappy customer would typically complain to 10 friends about a lousy experience with your product. In the Internet era, that number can easily bump up to 10 million.

That's because customers — with the help of new Web sites such as Epinions — are acquiring the ability to communicate their complaints or praises about your company to the world.

It was eBay that really pioneered this idea. eBay realized that the biggest roadblock to its success was the lack of trust between the buyers and sellers. For example, how could someone bidding on a point-and-shoot camera have confidence that the seller was being truthful about the camera's condition?

eBay's solution is the feedback forum. Auction winners are asked to rate their experiences as positive, neutral or negative and to provide a dozen words describing the transaction. Buyers' comments range from topics like the product's quality to how well the shipment was packed.

Many eBay sellers have accumulated hundreds of comments on the quality of their products and service. This is their form of a brand. Sellers with a history of positive comments can command a better price. Sellers with negative comments are shunned.

You may think this doesn't affect you, since you have no intention of setting up a site for your customers to openly complain about you or grade your performance.

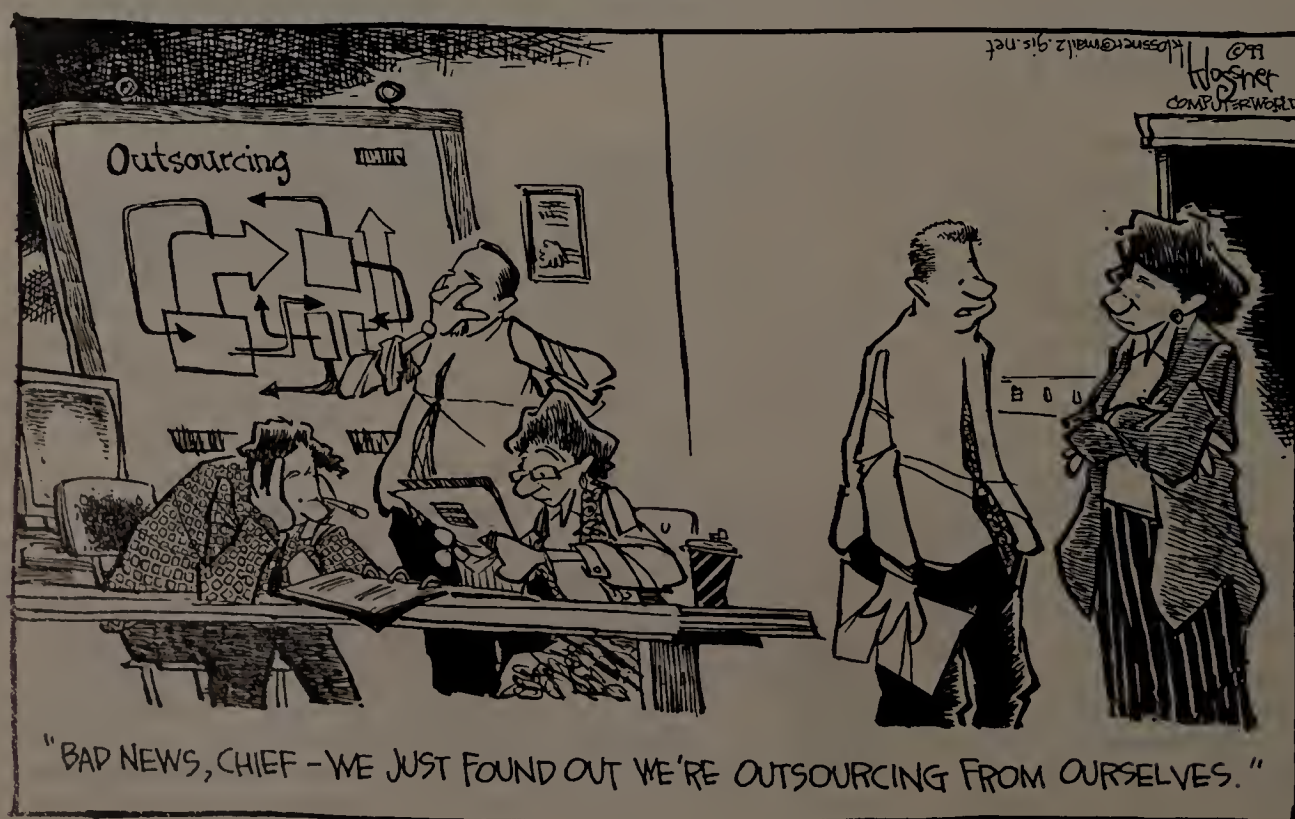
Well, if you don't do it, someone else surely will.

A growing number of Web sites are being established that solicit advice from consumers about which products are good and which should be avoided. The goal is to build databases of millions of comments, making the site irresistible for buyers seeking input on which bread maker, sneakers or automobile to purchase. The appeal to advertisers is obvious.

The most ambitious reputation manager so far is Epinions (www.epinions.com), which recently launched its "preview" Web site. While the company is starting off with the expected categories, such as consumer electronics, computers or automobiles, the operators intend to eventually build



DON TAPSCOTT is chairman of the Alliance for Converging Technologies. Contact him at column@tapscott.com.



massive databases that can even offer advice on the best dry cleaner or dentist in a particular neighborhood.

All visitors to the site are encouraged to share their views, and other users vote on whether the advice is useful. Contributors with opinions that are seen as good value can receive cash rewards depending on how often their reviews are read.

The upshot of sites such as Epinions is that soon almost every business, no matter how big or small, will acquire a digital reputation available to anyone in the world with access to the Web. Smart businesses will recognize that the best assurance of positive comments is simply to provide excellent value to the customer in the first place. ▀

DAVID MOSCHELLA

Be reasonable about monitoring Internet usage

FEW TOPICS ARE AS inherently controversial as whether companies should monitor their employees' e-mail and Internet usage. Perhaps the only thing that almost everyone agrees on is that all organizations should have some sort of written policy. Unfortunately, too many of these policies are so out of touch with everyday workplace reality and so hopelessly biased toward the employer that they often sound like they were borrowed from some old KGB security manual. Would you really want to

work for a company that tells you that you can't use company property to send an e-mail to an old friend or pass along a joke to a colleague?

Writing broad and easily understood guidelines is rarely easy, but it's often a worthwhile exercise. The following are five suggested rules that, to me at least, seem fair to both employers and employees:

1. The company recognizes that its employees have busy lives and long workdays and that this sometimes warrants the use of the company's computers, printers, copiers, telephones and networks for occasional and limited personal use. If an employee has any doubts about the meaning of *limited* or *occasional*, he should consult an immediate supervisor or human resources representative.

2. The company recognizes that employees aren't robots. Both during and after normal working hours, employees may occasionally access the Internet for non-work-related purposes (subject to the restrictions below), just as they are currently allowed to read newspapers in the company library or make occasional non-work-related telephone calls.

3. The company has no intention to broadly monitor the content of individual employee e-mail communications. However, in order to maintain a high-quality work environment, it does reserve the right to either randomly or systematically scan all employee e-mail for offensive words and phrases. Employees found using such language will be subject to disciplinary action, including termination.

4. Other than the aforementioned scan for offensive language, employee e-mail will never be reviewed without sufficient cause. Employees should be aware that valid potential causes include, but aren't limited to, the following: legal, ethical and customer issues; employee productivity and job performance concerns; unusual levels of network utilization; and complaints from fellow workers or other individuals. Any such e-mail review will formally involve both the employee's immediate supervisor and a

human resources representative.

5. The company reserves the right to block and/or monitor Internet access to any sites that the company deems to be offensive or undesirable. In addition, employees found to be visiting sites that aren't blocked that are subsequently found to be offensive are subject to review and possible disciplinary action. These offensive sites include, but are not limited to, sites focusing on pornography, violence, hate groups and similarly objectionable material of no business relevance.

Perhaps most important for IT professionals, the monitoring of employee behavior shouldn't primarily be the responsibility of the IT department. Just because IT can now keep track of many types of employee activity doesn't mean that it should, and many IT leaders would be wise to resist any management moves in this direction. More often than not, the value of monitoring messages or tracking employee time spent online and Web site visits won't justify the cost, financial or otherwise.

Both companies and workers have legitimate rights and needs. Right now, the balance is steadily shifting toward the employer. But, with all due respect to management, sometimes effective IT leaders need to speak up for the everyday employee. ▀

READERS' LETTERS

And if your windowshopper is corrupt . . .

ANNE McCRORY'S Jargon Judge article ["Browser Has Begun to Outlive Its Usefulness," *Business*, Oct. 4] reminded me of an opposite problem.

While *browser* seems to apply directly to less and less, the word *corrupt* applies to more and more. It's rare that I call up a technical support desk anymore where the presumably smiling and enthusiastic minion on the other end of the phone doesn't declare to me that something must be "corrupt."

Corrupt used to be something that happened to people. It meant "far gone" morally but "not altogether unredeemable." Later, it came to be something that happened to databases. It meant that something had gone wrong with relationships or records. But now drivers are corrupted, systems are corrupted, firmware is corrupted

and anything that travels on the Internet eventually becomes corrupt.

I'm afraid to go on the Internet alone anymore. Something that has gone corrupt is bound to find me, hit me on the head with a blunt object and take my wallet.

Eric Daeuber
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THE JARGON Judge column of Oct. 4, which discusses the term *browser*, is interesting because it challenges the current usage and suggests there may be an even better term.

In the good old days when I was a youth, many of the kids were limited to window shopping because they had no money to buy the goodies that were shown in the storefronts. There were many nose prints and handprints on the

glass as we tried to get as close to the displays as possible.

The term was *window shopper*, and it was defined by Webster's Third New International Dictionary, 1961, as "one that window shops."

Window shop was defined as "to look at the displays in store windows without going inside the stores to make a

purchase."

These old-fashioned definitions have implications today for the new world of the Web. When I use the Web, I don't browse — I window shop. The tool I use is a *windowshopper*.

Len Silvern
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Let's leave wackiness out of the workplace

JEFF ZBAR ["Tips for Making the Workplace Fun," *Business*, Sept. 20] is out in left field. He recommends that companies treat their employees like 8-year-olds.

I can state unequivocally that any company that makes me participate in costumed dress-up days or parade around the halls in wacky attire will not retain me in their employ for long.

Employees are most happy when they are

treated like adults, not like children.

Dave Durkin
Houston
durk@wt.net

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Allan E. Alter, columns editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8931; Internet: letters@computerworld.com. Include an address and phone number for immediate verification.



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ASPECT

Defining the Customer Experience

MICHAEL COHN

Hate buzzwords? Try these new, improved models

BUZZWORDS ARE boring — they drive me bonkers. After a long day of mishaps, meetings and memos, I couldn't look another buzzword in the face.

Except these. Because these words, abbreviations or phrases sound like real buzzwords but are mixed up with an extra letter or syllable. The result: better buzzwords that really describe what we think or feel. One little syllable can make a world of difference! In fact, there are hundreds of incredibly funny, ideally descriptive, better buzzwords out there, but these are the only clean ones they would let us print:



MICHAEL COHN lives in Atlanta, where he is a computer insultant. Contact him at mdyinc@aol.com.

Litigraytion: The incredible amount of time it takes to sue Microsoft for anything.

R.F.Plea: Begging to get on the bidders list.

Renotmediation: Getting someone else to make old Cobol code Y2K compliant.

Downsighs: The sadness that comes with dropping your palmtop down the back of the credenza.

Internot: A busy signal from your Internet service provider.

I.P.Owe: What happens when your hot new dot.com stock has a really bad week.

E-coma-erce: An e-biz project that's dead in the water.

Programmer ranalysts: Techies who run off as soon as they get a better offer.

Aginhate: When your document page-breaks just before the very last line.

Computer-dazed training: Any online education lasting longer than 15 minutes.

Y2Chaos: Jan. 1, 2000.

Worst-case scenoreo: When your 3-year-old daughter sticks a crème-filled cookie in your disk drive.

Point and croak: The last thing you did that crashed the machine.

Month-end clothes: The wrinkled polyester suit you're still wearing from yesterday because you haven't gone home in 36 hours.

Voice reclognition: Speaking way too fast for your talk-and-type software.

Job hopenings: Praying to fill three slots for Web developers but never receiving a single résumé.

Job enterfew: Dying to speak to anyone who can even spell *Web developer* while you waste the better part of a weekend working a career fair.

Job va-can't-see: Losing your last Web developer because he can't see staying on board for \$22,500,

even if he does have the big cubicle near the window.

Local arial network: The momentary, but probably ill-advised, satisfaction brought about by hurling your PC over a cubicle wall.

Doubt.com: Knowing you should have bought Amazon.com stock years ago.

Warehosed: Being way overcharged by data management consultants.

Mission-cryptical: We know this application is important; we just don't have a clue what it does.

We-sponse time: What happens when everyone on our floor hits the "enter" key at once.

Jellecommuting: Spending too much time eating desserts from the fridge 'cause you're working from home.

E-mayl: Having no idea if someone receives it or not.

Temporarily out of surface: Being unable to use your laptop because the guy in 29C just leaned back, inserting your tray table 6 inches into your spleen.

Next assailable representative: Who you'll talk to after you've been on hold for 75 minutes. ▀

MICHAEL CUSUMANO

A brighter future: Mozilla and open sourcing redux

IMUST APOLOGIZE to readers of my last column ("Mozilla Gambit Reveals Risks of Open Sourcing," Oct. 18) and to people working on Mozilla, Netscape's open-source version of its browser source code. I wanted

to make two points that I still believe:

that open-source development may not help a public company deliver software products in a predictable time frame;

and that the Mozilla project not only has yet to deliver the 5.0 version of Navigator,

but it may also never salvage the market share of Netscape's browser.

Both are judgment calls open to debate, which I wanted to provoke.

That said, I missed or confused some basic facts. I held on too long to old information and negative impressions of Mozilla from last year, following the hype that open source was Netscape's answer to the Microsoft juggernaut. I combined Mozilla with Navigator, which I now see as sepa-

rate. I didn't follow the project closely enough.

For example, I took recent complaints from developers I know that Mozilla code remains difficult to understand and unstable on some machines as meaning that parts of the old code base and spaghetti-code problems must persist. I was wrong. Mozilla appears to be all or nearly all new code. The last build in particular seems to be an excellent piece of cross-platform software engineering, as good or better than anything Netscape produced on its own. This is progress, not failure.

I also associated delays in Netscape's attempts to deliver Navigator 5.0 with the failure of open source. Responses to my column indicate that delays came from wasting time with the old Navigator 4.x spaghetti code (sometimes referred to as "Mozilla Classic") and the decision in October 1998 to rewrite the browser to be more modular and easier to understand. I knew Netscape did a poor job architecting 4.x because I chronicled the gruesome details in a book last year. I also knew the Mozilla team forced the rewrite of major components — resulting in a yearlong delay.

But in retrospect, it is unfair simply to blame Mozilla and the open-source process for the delays and for making schedules more unpredictable. The rewrite was unavoidable. Netscape deserves the blame for not rearchitecting the browser code earlier.

Then there is the licensing. I have now heard from many non-Netscape developers who insist that Netscape's Mozilla license doesn't discourage people who believe in open source from contributing code. Most (but not all) comments also indicate that Netscape doesn't exert any undue control over the project, though it retains some special licensing rights.

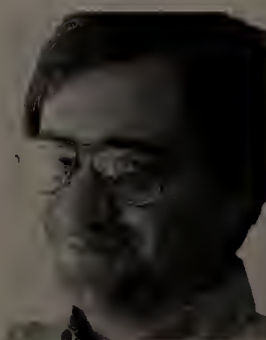
I learned about other real positives in the Mozilla project: Open source has inspired major improvements in Netscape's development methods, with much more emphasis on bug analyses, newsgroups and other feedback loops and code reviews and documentation, in addition to more modular code. Mozilla.org was slow to provide a road map of where it was heading, but momentum now seems to be gaining.

Ten or so major corporations, including Intel, appear to be committing resources to the project. Perhaps most promising is Mozilla's potential as a cross-platform technology base that could greatly simplify Web applications development. There is a renewed vision and "can-do" attitude permeating the Mozilla team.

I ended my last column criticizing open-source development as a "free lunch." I realize now that if this process is to operate effectively, it requires enormous effort from companies such as Netscape (and IBM, which has done well with the Apache Web server) and participating outside developers. It doesn't look so free to me anymore.

The jury is still out, but the future looks brighter for Mozilla and open source than I had thought, although I remain skeptical regarding how much and when Netscape Navigator will benefit.

The Mozilla team still has something to prove. It needs to finish and deliver a product. ▀




MICHAEL CUSUMANO, co-author of *Competing on Internet Time: Lessons from Netscape and Its Battle with Microsoft*, is a professor at the MIT Sloan School of Management. Contact him at cusumano@mit.edu.

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BAD Y2K DATA

Your suppliers can hurt you with their non-Y2K-compliant data. Some users are building software filters to weed out two-digit year fields or other erroneous calculations. ▶ 38

STATS ANALYSIS

A 23-year-old analysis engine is helping USA Today.com attract users and keep them there. Using the Web-based reporting and analysis tool, users can get reports comparing hundreds of stats on their favorite sports stars, keeping them at the site longer. ▶ 38

EVALUATING IT

Paul A. Strassmann disagrees with those who rank companies based on IT innovation. Judging by the financial results of the companies at the top of the list, IT doesn't add much value. No matter how much you believe in the power of technology, financial reports are more reliable indicators of any benefits of IT, he writes. ▶ 40

FREE AGENTS

IT workers job-hop more than the general population, but IT managers are more on the lookout than the techies who work for them. According to a Kelly Information Technology Resources survey, 80% of IT managers said they'd be interested in becoming free agents vs. 64% of nonmanagers. Manager burnout and the desire to get back to technical work may be explanations. ▶ 40

JOB LOYALTY

Hiring managers say a résumé with a history of job loyalty is good, but it's important not to stay at a job too long. When does loyalty become a drawback? ▶ 52

NET FRONTIER

How do IT people survive at companies on the Internet frontier? Our look at four trailblazers reveals that success depends on speed, the ability to handle several jobs at once and the ability to attract the right talent. Traditional wisdom helps — but only if it doesn't get in the way. ▶ 54

INFOMEDIARIES

One way to make money on the Internet is to collect and package information for people you trust to be unbiased. Such infomediaries provide independent reviews and pricing lists and other information. They profit by helping buyers and sellers find each other. See Business QuickStudy. ▶ 58

START-UP FEVER

Should you list your programming skills on your résumé, or concentrate on the projects you've designed and completed? Career Adviser Fran Quittel says go for both. She also tells an e-commerce-bound reader to join an early-stage company that's already funded, rather than go it alone. ▶ 60

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Opinion: Paul Strassmann . 40



LISA WEANS

IT JOBS: THE PAY AIN'T ENOUGH

TECHIES LIKE BERNIE CHANDLER (above) say their information technology jobs don't pay enough. Nearly 60% of techs responding to *Computerworld's* 1999 Annual Salary Satisfaction Survey said they're unhappy with their current salaries — which they think are way below average — and bonuses don't help much. Most stay, though, for the benefits, training and chance to work with leading-edge technology.

44

Weeding Out Other People's Bad Y2K Data

Some users are building 'defensive code' to stop errors coming in from third parties

BY THOMAS HOFFMAN
AND MITCH BETTS

NOW THAT you've finished all your year 2000 prep work, you can sit back and relax. Right? Wrong. Bad data can still sneak into your electronic network from a variety of sources, including suppliers whose systems aren't Y2K-ready, data entry mistakes and suppliers that didn't heed a request to update their electronic data interchange (EDI) formats.

But some users are building filters to screen out two-digit year fields or other erroneous calculations in financial and other data their business partners send and kick them out before they can skew a production run.

Some companies that have extensive electronic interfaces with business partners and suppliers — such as retail giant Sears, Roebuck and Co. — are installing front-end filters to their computer systems to catch any Y2K-faulty data from outside their companies before it hits their production environments.

Long before year 2000 problems emerged, "there was always that concern about receiving bad data," said Ken DeWitt, vice president and century compliance officer for the information technology organization at Hoffman Estates, Ill.-based Sears.

The retailer has a series of checks and balances in the front-end systems it uses to handle EDI transactions, said DeWitt. EDI transactions, for example, have control totals and values that can be checked using EDI software, he said. In some of the third-party EDI

software that Sears runs, those checks and balances are built in to the system. In other cases, Sears has customized its EDI systems to conduct those checks.

Few companies have had the foresight to build filtering systems or so-called defensive code to filter input for critical systems that use date-sensitive information, said Capers Jones, chairman of Software Productivity Research Inc. in Burlington, Mass. Those that have

built them typically rely heavily on electronic interfaces with their business partners, including retailers, manufacturers and financial services companies, added Jones.

"Edit checks" are another way to combat the problem. These are commonly used routines in soft-

ware applications that verify data formats and catch faulty data before they reach transaction-processing systems. If they aren't built in to the application, then add-on filter processes may be necessary.

The use of data editing and verification routines to screen incoming data "is a good EDI practice that a lot of people hadn't thought about implementing until they started working on Y2K," said Joel Ackerman, executive director of the Rx2000 Solutions Institute, a Minneapolis-based nonprofit clearinghouse on health care Y2K issues.

As part of Sears' year 2000 planning, DeWitt and his team are also working with each of the retailer's business units to write and install scripts and monitors that were designed to review all applications that input or output critical dates. Those monitors, which are be-

ing installed on financial, human resources, product replenishment and other applications, will be tested throughout Sears by early next month, said DeWitt.

Sears isn't alone. Sabre Group Inc., the Dallas-based travel reservations giant, last

November had the following year 2000 statement posted on its Web site: "Defensive code will be installed to protect the company's real-time systems from improperly formatted date data supplied by third parties." Sabre didn't return calls seeking further explanation.

Financial Tool Crunches Baseball Numbers

Interactivity makes Web site 'sticky'

BY ROBIN ROBINSON

Twenty-three is an age at which some baseball players enter the prime of their game, but 23 in technology years makes you a granddaddy. So how is a 23-year-old financial analysis engine helping USAToday.com draw rabid baseball fans to its site? By processing something baseball and finance have in common: lots of numbers.

"It's really a way to supplement our baseball coverage, to compare data across every possible thing you can think about in terms of postseason performance. It gives fantasy-leaguers an in-depth view of postseason baseball coverage," said Susan Lavington, director of marketing at USAToday.com.

The application is WebFocus, a Web-based reporting and analysis tool developed by New York-based Information Builders Inc. from its existing Focus product, one of the earliest fourth-generation application development languages. The tool was designed to help users drill into their data to track inventory, facility utilization rates or Ken Griffey Jr.'s on-base percentage.

The application gives fans a point-and-click way to create reports that list players who meet certain criteria — like batting above .300 in 1999 postseason play — and compare all their offensive statistics.

"It is definitely a way to

make us sticky. [Users] stay around longer and interact with the site," Lavington said.

"And interactivity is so important," said Chet Czarniak, sports editor at USAToday.com. His technical team and Information Builders installed the analytical tool Oct. 5 in a relatively painless procedure using frames the site already had in place to customize the interface.

The site had a daily average of 2,000 to 3,000 visitors using the analysis tool the first week, he said, and the numbers were trending upward.

"That's significant, because when you get to playoffs, the traffic tends to drop off; you'll tend to see the fans drop off. But in this case, it's building," Czarniak said.

Before rolling out the service, Czarniak ran it by an impromptu test committee of a half-dozen fantasy-league players and columnists. "They all came back and said, 'Cool,' or, 'Really cool,'" he said.

"Focus has been around in technology terms for a million years, and this is interesting that it shows if you wait long enough, the market comes back to you," said Howard Dresner, an analyst at Gartner Group Inc. in Stamford, Conn.

His informal survey of business analysis users showed they recognized WebFocus, but not Information Builders. The tool will continue to be available on USAToday.com's site until at least Nov. 6. Then Czarniak and the content team will consider whether to expand it for other sports. ▀

One of the potential downsides of using front-end filters is that they can act as a bottleneck when trying to process a flood of incoming data. In turn, that could disrupt processing schedules, said Willie C. Kennedy Jr., Y2K project manager at bank holding company KeyCorp in Cleveland.

That's why internal edits that are built in to programs are typically better than front-end filters, said Kennedy. But internal edits aren't always an option, because they can't be added to some applications. ▀



SEARS' KEN DEWITT
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WORKSTYLES

Managers Lean Toward Free Agency

It's no secret that job-hopping has become the norm for all American workers. But a study released last month indicates that IT workers – particularly those who are managers – may be more likely to regard themselves as “free agents” than the general population.

Kelly Information Technology Resources, a division of Kelly Services Inc. in Troy, Mich., conducted the survey of almost 700 information technology professionals. The study defined a free agent as someone whose goals involve building skills rather than a long-term career with an employer.

About 64% of nonmanagerial IT workers surveyed said they plan to stay long term with their employers, vs. 71% of all workers. But almost 80% of technical managers expressed interest in being a free agent.

Job Satisfaction

Although many factors could explain the disparity, one reason could be that some IT managers are less satisfied in managerial roles and therefore more likely to switch employers, said Kelly Vice President Michael Shebak. He said the data and his own experience with IT professionals suggests that employers who want to keep their best technical workers should keep them as techies.

Dawn Randall, a Kelly contractor who works as a network security administrator at Johnson & Johnson, agrees. Randall, who said she sees a long-term future as a contractor at

Johnson & Johnson, said “managing personnel doesn't appeal to me. I'd rather work as a peer. [Managers have] a lot of things aside from technology you have to deal with.”

Michael Boyd, program manager of human resourcing strategies at International Data Corp. in Framingham, Mass., added that IT managers may be more likely to view themselves as free agents because they have a wider range of skills that are useful at start-up firms that need management direction. “[IT managers] are more in touch with the labor market. They know they can take their skills elsewhere,” Boyd said.

Most IT managers entered technology because they enjoy solving technology problems, said Boyd. But to make money and distinguish themselves, they take managerial roles and may burn out after a few years.

Shebak suggested that one way to keep techies happy is to put them on project teams, where they might co-manage a project and receive support from business employees. A team-based approach can help assimilate contract workers. “It appears that [contractors] are immune from [office] politics, but that's not true. They're as much a part of the politics and workings of an organization” as any employee, said Boyd.

It's easier for contractors to assimilate and be productive, he said, “when everyone you're working for is playing in the sandbox together.”

— Julekha Dash

Loyalty Numbers

IT managers are more likely to wander to another job than IT workers

| QUESTION/STATEMENT | IT MANAGERS | NONMANAGERIAL IT WORKERS |
|--|-------------|--------------------------|
| Very or somewhat certain to change employers | 56% | 49% |
| Plan to have a long-term career with my current employer | 59% | 65% |
| Definitely want to be free agent or open to free agency | 79% | 64% |
| No desire to be a free agent | 36% | 22% |

Base: Survey of 669 IT professionals; multiple responses allowed

PAUL A. STRASSMANN

Innovation paradox

NONE OF MY *Computerworld* columns has generated as many comments as the Sept. 6 analysis of the computer paradox. Readers were troubled by the absence of any correlation between IT spending and corporate profits, which is perhaps the most accurate way of defining and measuring the paradox.

The letters noted that rapidly falling prices of desktop computers, as well as the explosion in Internet use, were self-evident proofs of productivity gains from computerization. The fact that none of these developments has so far shown up favorably in corporate financial data didn't seem to discourage anyone.

A leading IT magazine has come up with a novel response to the computer paradox. It has suggested that IT-based innovation is the source for creating new business value. The magazine ranked 500 U.S. corporations according to their innovative capabilities. Corporations engaging in e-business, enterprise resource planning, data mining, enterprise portals or similar buzzword-compliant activities received gold, silver or bronze “medals.” Four gold medals put a company in the top rankings.

I could argue over the process by which individual firms were awarded their ranks, because the findings reflected the unverifiable opinions of the IT people who were surveyed.

But I won't, because we need not depend only on surveys to assess business value. Audited financial reports offer more reliable indicators. When IT executives spend money, they are acting on behalf of the firm's shareholders. Therefore, the most appropriate metric for judging business value from computer-based innovations would relate them to net profits, operating profits and return on shareholders' equity.

To verify the trustworthiness of the magazine's innovation rankings, I devised a way to compare top- and bottom-ranked corporations. The question was whether a company awarded four gold medals would deliver greater business value than one with four bronze medals.

Because only 450 of the magazine-ranked firms published their complete financial results, I chose the top 45 ranked firms (such as Marshall Industries, Microsoft and Sprint) and compared their average financial performance with the bottom 45 (such as American Greetings, Tidewater and Textron).

How well did the innovation rankings compare with the financial measures of value creation? They didn't hold up:

■ **1998 operating income growth over 1997:** The bottom 45 outgrew the top 45, 18.3% to 15.4%.

■ **Five-year average net income growth:** The bottom 45, 14.8% to 14.3% for the top.

■ **Five-year average net equity growth:** Again, the bottom 45 outgrew the top 45, 18.5% to 16.2%.

■ **Five-year average employee growth:** The top 45 finished ahead, 10.2% to 8.5%.

So, the bottom-ranked 45 firms showed better results than the top 45 in three of the categories that measure financial performance. There were other interesting indicators, but I included only the five-year employment growth compar-

isons. When it came to hiring, the top “innovators” exceeded the growth rates of the bottom-ranked firms. The innovators grew faster in personnel but not in business value.

It's often argued that the benefits of innovations show up only in the long run. That may be true about many start-ups, but the rankings discussed here cover only well-established firms whose shareholder values depend on historical as well as current financial performance.

Where I've served as CIO, I've always favored innovation. But the current frenzy to adopt new computerized practices without examining the cash benefits can be damaging, especially if a leading publication blesses such a point of view. As in any arms race, the speed and expense for adopting computerized solutions must be tempered by sober economic analysis. For a business to survive, it must be steadily prof-

itable and increase shareholder value at rates superior to those of its competitors. Magazine surveys that rely on surveying opinions about technological excellence aren't credible if the financial results don't support such claims. ▀

Strassmann (paul@strassmann.com) prefers “show-me-the-money” metrics for judging the business value of computers.

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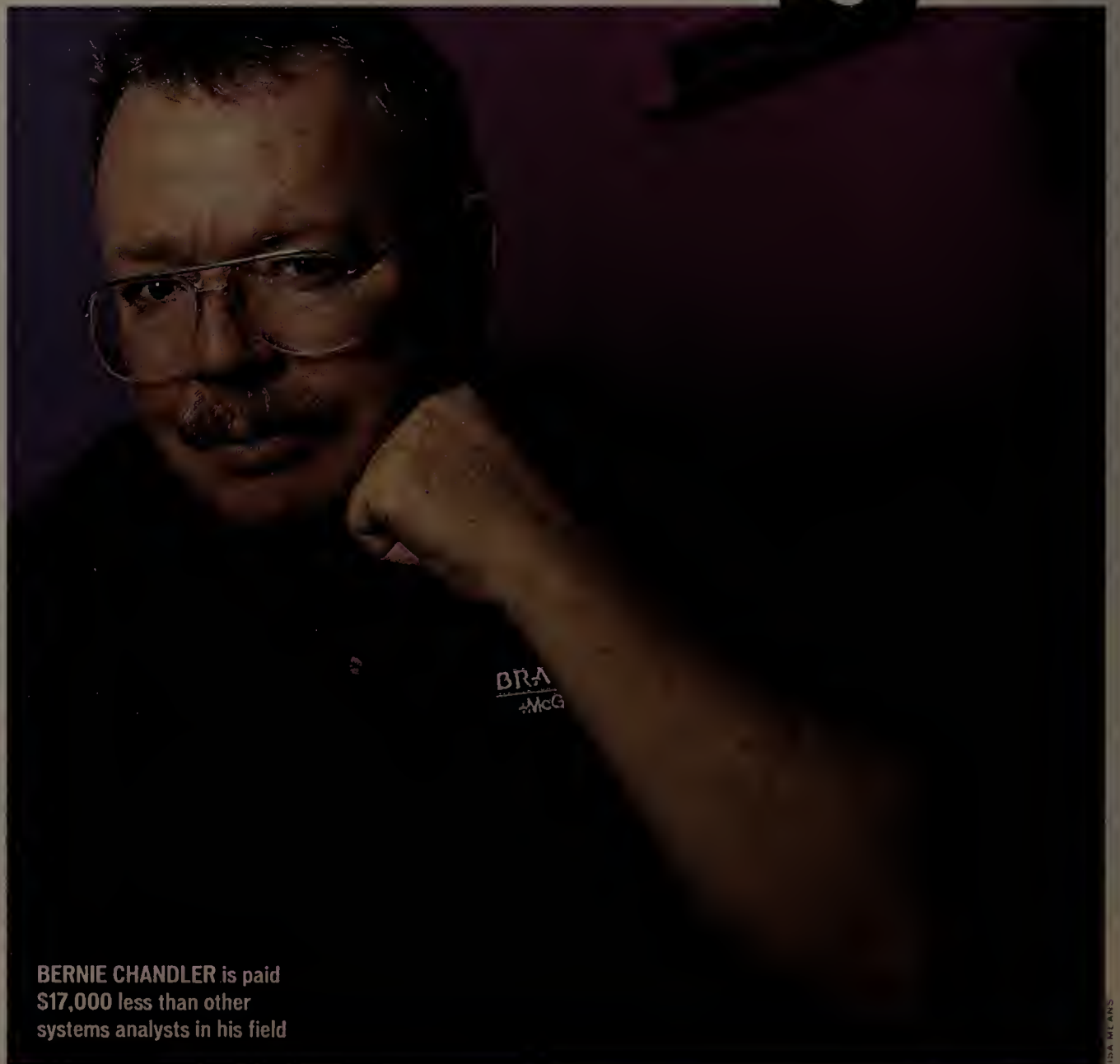
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The Pay Ain't Enough

COMPUTERWORLD'S
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SATISFACTION SURVEY

Just when IT managers thought they could put the brakes on skyrocketing paychecks, IT professionals counter that their salaries still aren't high enough. Their biggest gripes? Lousy bonuses and poor nonmonetary recognition
By Deborah Radcliff



BERNIE CHANDLER is paid \$17,000 less than other systems analysts in his field

BERNIE CHANDLER has more than 20 years of information technology experience under his belt. But for all his experience, he's still earning \$17,000 less than his senior systems analyst peers with less experience.

Back in 1978, Chandler dumped his career in production control for technology work, but even then, he failed to get the big bucks for building and programming pharmacy computers from scratch.

It was a great job — he would deliver the computer via private plane to a pharmacist, who would wait at the landing strip with a pickup truck. Chandler would stay for three days to install the computer and train the pharmacist before another plane picked him up.

"I loved that job for the learning and the travel, but I was paid a lot more for being in production control at my previous job," explains Chandler, who has a degree and is now a systems analyst and team leader in the electronic data switching department at a large medical supplier near Dallas.

Chandler still works for the opportunity to continue learning. He's also working for something less tangible — a laid-back environment. He's not, however, working for a great salary.

"I would say I get paid a few thousand under what you would normally get for this type of work," says Chandler, who earns \$60,000 per year. That's \$17,000 less than senior systems analysts in the pharmaceutical industry nationwide and \$30,000 less than project managers for systems programming departments in the same vertical, according to *Computerworld's* Annual Salary Survey, published Sept. 6 (available at www.computerworld.com).

We all hear about the astronomical salaries IT workers are hauling in these days. But who out there is really earning them? Certainly not the bulk of those who answered *Computerworld's* 1999 Salary Satisfaction Survey.

In it, nearly 60% of 600 IT respondents say they're dissatisfied with their current salary. That may sound surprising to many IT managers, given the salary survey numbers bantered around the technology community. But overall, the trends uncovered in this year's satisfaction survey reveal more of the same unhappiness we found last year.

So, what's really going on out there in the IT workforce?

Training Reimbursement a Plus

A systems administrator with two years' experience says he and his co-workers are treated like underpaid grunts in go-nowhere jobs.

An H-1B visa worker with a computer science degree and six years' experience is stuck in a low-paying job as he waits it out for his green card.

An experienced programmer/analyst with a degree tells us he makes \$40,000 — well below *Computerworld's* Annual Salary Survey average of \$53,000.

Although stories like these flooded *Computerworld* last month, hiring managers continue to project strong salary growth in IT jobs.

"In 1999, growth for technical salaries rose 7.3%, with some specialty areas like application programmers increasing over 10%. Our research supports continued growth of competitive pay rates nationwide," says Tom Cole, branch manager at the San Francisco office of RHI Consulting Inc., the Menlo Park, Calif.-based job placement and temporary staffing firm. "And it's important to realize that employers are offering some forms of nontraditional compensation — flex hours, job sharing and such."

Special Report, page 48

IT PROFESSIONALS ARE UNHAPPY WITH THEIR PAY

Given the current conditions of your local job market, do you feel you are adequately compensated for your job responsibilities and your experience?

| JOB TITLE | SATISFIED | NOT SATISFIED | DON'T KNOW |
|---------------------------------------|-----------|---------------|------------|
| CIO/vice president of IT | 36% | 57% | 7% |
| Director of IT operations | 32% | 64% | 4% |
| Director of technical services | 40% | 20% | 40% |
| Computer operations manager | 18% | 71% | 11% |
| Manager of client/server computing | 32% | 64% | 4% |
| Director of network services | 29% | 29% | 42% |
| Manager of network support | 40% | 47% | 13% |
| Network administrator/analyst | 15% | 77% | 8% |
| Database analyst | 7% | 73% | 20% |
| Systems analyst | 28% | 56% | 16% |
| Systems programmer/Unix administrator | 29% | 64% | 7% |
| Programmer/developer | 29% | 54% | 17% |
| Programmer/analyst | 35% | 43% | 22% |
| Computer operator | 0.0% | 71% | 29% |
| Manager of technical support | 31% | 58% | 11% |
| Technical specialist | 26% | 61% | 13% |
| Help desk operator | 14% | 71% | 15% |

Survey base: 488 IT managers and professionals; only job titles with sufficient response rates are shown.

CONSULTANTS' VIEW ON SALARIES A MIXED BAG

Here's a look at how IT consultants rank their salary satisfaction levels:

| JOB TITLE | SATISFIED | NOT SATISFIED | DON'T KNOW |
|------------------------|-----------|---------------|------------|
| Senior partner | 33% | 33% | 34% |
| Junior partner | 0.0% | 33% | 67% |
| Management consultant | 46% | 46% | 8% |
| Senior consultant | 52% | 44% | 4% |
| Entry-level consultant | 30% | 40% | 30% |

Survey base: 84 IT consultants; only job titles with sufficient response rates are shown.

IT PROS AT VENDOR COMPANIES FEEL SLIGHTLY BETTER

Here's a look at how IT professionals and managers rank their salary satisfaction levels at technology vendor companies:

| JOB TITLE | SATISFIED | NOT SATISFIED | DON'T KNOW |
|---------------------------------------|-----------|---------------|------------|
| Vice president or director of R&D | 50% | 50% | 0.0% |
| Manager of R&D | 57% | 14% | 29% |
| Director of sales/support | 25% | 25% | 50% |
| Director of customer support | 50% | 17% | 33% |
| Customer support professional | 12% | 88% | 0.0% |
| Tester/quality assurance professional | 50% | 50% | 0.0% |
| Junior-/intermediate-level developer | 30% | 70% | 0.0% |
| Software architect | 22% | 44% | 34% |
| Software engineer/developer | 19% | 59% | 22% |

Survey base: 102 IT managers and professionals; only job titles with sufficient response rates are shown.

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COMPUTERWORLD'S ONLINE **Salary** SATISFACTION SURVEY

Continued from page 45

Indeed, most of the respondents rated their companies' training reimbursement programs as "good" or "very good." They similarly rated their opportunities to work on leading-edge technology projects. Some even said training, or the opportunity to work with leading-edge technology, is why they stay with their current employers, despite lower-than-average pay.

Fortunately, bonuses are helping to make up for salaries, many IT professionals reveal. Nearly 70% of workers at IT user companies report some level of satisfaction with their bonuses. The numbers aren't as good at vendor companies or consultancies.

Of all the salary dissatisfaction stories, Jonathan Smithley tells one of the worst. Smithley (not his real name), a database administrator with two years' experience, just received a 4.1% merit increase — his first. He's still making only \$33,000 per year while living in California's Silicon Valley — an area with one of the highest cost-of-living indexes in the country.

"We don't get overtime pay, but there's an impossible amount of work. You get depressed by the end of the day, working around people who are treated like slaves," says Smithley, 22, who likens his work life to that of the popular "Dilbert" comic strip. "I rent a room on a block in the poorer part of San Jose. My car's gotten broken into."

Smithley, who is versed in the Internet programming language HTML and Microsoft Corp.'s database language system FoxPro, is trying to improve his career situation by attending night classes for an MIS degree, for which his company is reimbursing him \$8,000 per year. He's also looking for work in parts of the country where the cost of living is significantly lower.

"As soon as my company stops paying for school, I'm out of here," Smithley says. "Unfortunately, everybody in Silicon Valley wants someone with three to five years' experience, so it's hard to find another job."

Chandler says he finds the best way to raise his salary is to change jobs every two years. But he has settled for less tangible perks at his current company — a laid-back environment, the chance to work on his favorite Unix machines and a generous tuition-reimbursement program.

Moving Around Helps

Gregg Anderson also knows the value of changing jobs. Anderson, lead project manager at a large regional telecommunications firm, says he, too, took a cut in pay to leap from geological engineering to technology.

"Since I considered this a career change, I looked at that first job as an internship," explains Anderson, 37. After six years, "it started paying off. I started seeing 10%, 12% pay increases, but I still wasn't very satisfied with my salary."

Special Report, page 50

HOW IT PROFESSIONALS FEEL ABOUT THEIR PERKS AND BENEFITS

IT professionals may seem like a greedy lot, according to the results of Computerworld's Second Annual Online Salary Survey. Every time managers say they have gone high enough (Computerworld's Annual Salary Survey, Sept. 6), IT professionals say "not quite." Worse yet is how they rate their opportunities to receive training, work with new technologies, their relationships with their managers and their understanding of the IT/business mission.

Given the current conditions in your local job market, do you feel you are adequately compensated for your job responsibilities and your experience?

| | USERS | VENDORS | CONSULTANTS |
|------------|-------|---------|-------------|
| Yes | 29% | 31% | 47% |
| No | 64% | 50% | 50% |
| Don't know | 7% | 19% | 3% |

How satisfied are you with your total salary (base plus bonuses)?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 16% | 17% | 13% |
| Somewhat satisfied | 29% | 25% | 20% |
| Neither satisfied nor dissatisfied (or N/A) | 29% | 29% | 32% |
| Somewhat dissatisfied | 20% | 24% | 25% |
| Very dissatisfied | 6% | 5% | 10% |

How satisfied are you with the opportunity to receive performance bonuses and with the amounts of those bonuses?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 49% | 36% | 28% |
| Somewhat satisfied | 31% | 26% | 25% |
| Neither satisfied nor dissatisfied (or N/A) | 6% | 18% | 27% |
| Somewhat dissatisfied | 9% | 14% | 14% |
| Very dissatisfied | 5% | 6% | 6% |

How satisfied are you with nonmonetary recognition of your job performance from management?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 19% | 16% | 14% |
| Somewhat satisfied | 23% | 22% | 23% |
| Neither satisfied nor dissatisfied (or N/A) | 30% | 33% | 36% |
| Somewhat dissatisfied | 21% | 22% | 20% |
| Very dissatisfied | 7% | 7% | 7% |

How satisfied are you with the availability of training at your company?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 14% | 16% | 21% |
| Somewhat satisfied | 20% | 20% | 19% |
| Neither satisfied nor dissatisfied (or N/A) | 25% | 29% | 17% |
| Somewhat dissatisfied | 26% | 20% | 26% |
| Very dissatisfied | 15% | 15% | 17% |

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COMPUTERWORLD'S ONLINE Salary SATISFACTION SURVEY

Continued from page 48

Then when Anderson took his current job last year, he raised his pay by approximately 40%. Now, he says, he's very satisfied with his salary. "I'm now earning \$78,200 . . . and here, we can earn performance bonuses of 10% to 12% of our annual base," he says.

Anderson is also cashing in on his company's training reimbursement program. He's working toward an MBA and learning Extensible Markup Language and Java. When he earns his MBA, he says he expects to command even higher pay.

But Kenny Kon, a software engineer at a large reservation system company in the Southeast, doesn't have the luxury of changing jobs to raise his pay. Kon, 31, is an H-1B visa worker from Singapore.

Despite his computer science degree from the University of Arkansas in Fayetteville and his six years of experience, Kon is earning \$60,000 per year developing communications programs that link his company's airline reservation system to other reservation systems, like those at cruise lines and car rentals.

Depending on where in the Southeast Kon works, he could earn up to 20% more than his current salary, especially if he were to work in the Atlanta area, says Charles Bythewood, an Atlanta-area recruiter at Pencom Systems Inc., a job placement firm in New York. "I'm in a situation where I'm at a disadvantage," Kon says. "I'm on H-1B. I don't have much bargaining power. In a sense, everyone on H-1B is in the same boat."

Benefits Count

Benefits are what keep Tom Gaughan at his low-paying programmer/analyst job for a large insurance company on the East Coast. Gaughan, who has a four-year degree in mathematics, some Java and C++ experience and is fluent in Cobol and SQL, earns \$40,000 per year.

"I know my salary is low compared to the rest of the market, but the good thing about this company is profit sharing," Gaughan explains. "Last year, I earned 32% of my salary, and we're looking at 30% again this year."

Gaughan says he feels he owes his current company some loyalty for taking him out of the actuary business and training him in technology three years ago. He's also taking advantage of educational reimbursement as he works on his master's degree in information systems at Virginia Tech University in Blacksburg, Va.

"Reimbursement for education is another benefit, especially in the technical fields, where it's necessary to keep up with the latest technologies," he says.

But Gaughan isn't overly loyal. With the average price of a home in his area hovering around \$300,000, he says he knows it's only a matter of time before he needs to find a higher-paying job. ■

Radcliff is a freelance writer in Santa Rosa, Calif.

How satisfied are you with the opportunity for advancement at your company?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 24% | 18% | 17% |
| Somewhat satisfied | 28% | 21% | 19% |
| Neither satisfied nor dissatisfied (or N/A) | 28% | 34% | 31% |
| Somewhat dissatisfied | 15% | 18% | 23% |
| Very dissatisfied | 5% | 9% | 10% |

How satisfied are you with the opportunity to work on leading-edge technology projects?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 13% | 13% | 9% |
| Somewhat satisfied | 18% | 23% | 19% |
| Neither satisfied nor dissatisfied (or N/A) | 27% | 22% | 30% |
| Somewhat dissatisfied | 31% | 28% | 26% |
| Very dissatisfied | 11% | 14% | 16% |

How satisfied are you with the ability to be flexible in job scheduling?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 9% | 11% | 9% |
| Somewhat satisfied | 9% | 8% | 10% |
| Neither satisfied nor dissatisfied (or N/A) | 24% | 17% | 24% |
| Somewhat dissatisfied | 30% | 31% | 32% |
| Very dissatisfied | 28% | 33% | 25% |

How satisfied are you with your working relationship with your manager?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 7% | 4% | 4% |
| Somewhat satisfied | 11% | 9% | 7% |
| Neither satisfied nor dissatisfied (or N/A) | 21% | 19% | 20% |
| Somewhat dissatisfied | 31% | 43% | 40% |
| Very dissatisfied | 30% | 25% | 29% |

How satisfied are you with the opportunity to discuss career goals with your manager?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 3% | 4% | 8% |
| Somewhat satisfied | 10% | 7% | 8% |
| Neither satisfied nor dissatisfied (or N/A) | 23% | 27% | 21% |
| Somewhat dissatisfied | 45% | 45% | 41% |
| Very dissatisfied | 19% | 17% | 22% |

How satisfied are you with your understanding of the IT/business mission?

| | USERS | VENDORS | CONSULTANTS |
|---|-------|---------|-------------|
| Very satisfied | 13% | 14% | 14% |
| Somewhat satisfied | 21% | 15% | 16% |
| Neither satisfied nor dissatisfied (or N/A) | 33% | 32% | 28% |
| Somewhat dissatisfied | 23% | 27% | 26% |
| Very dissatisfied | 10% | 12% | 16% |

METHODOLOGY: On Sept. 13, one week following our 1999 Annual Salary Survey, *Computerworld* asked readers to go to our Web site, review the published salary data for their particular title and tell us how their salary compared with the published figures. Our survey was posted online at www.computerworld.com. Results shown here are the opinions of 674 information technology professionals at user, vendor and consultant organizations.

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- The New York Times, Carole Gould, May 9, 1999

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- Upside, May 5, 1999

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- Fortune.com, April 12, 1999

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- Forbes ASAP, April 5, 1999

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LOYALTY: ASSET OR LIABILITY?

BY FAWN FITTER

CHANGING JOBS OFTEN can obviously ensure that you're up on the newest skills. But it might also make a hiring manager suspect you're just playing top-this-offer roulette.

On the other hand, information technology is changing so quickly that if you stay in the same place too long, you won't have five years of experience — you'll have the same year of experience repeated five times.

So, just how long on the job is too long? Or how many job changes on your résumé is too many? *Computerworld* asked several hiring managers and recruiters what they prefer to see on a résumé: plenty of motion or long-term stability. Here's what they revealed when asked whether they feel that a history of job loyalty is an asset or a liability in a potential hire:

"Technology changes daily, so you can't measure loyalty in decades anymore. For the most part, I look more favorably on people who have stayed on the job for a while — at least a year, with no gaps in between. If [employees are] worth anything, employers want to retain them — they don't want the technology to

leave, and they don't want it to be stolen."

— *Larry Johnson, a technical recruiter at Baldwin Forrester and Co., a high-tech recruiting firm in San Francisco*
(✓) ASSET () LIABILITY

"I can certainly understand how consolidation and advances in technology make people move more rapidly, but I still infer a certain degree of stability when . . . someone's been at a job for three to five years.

If I see someone who's changed jobs every year, I think they're not going to be around long enough for us to recoup our investment in them."

— *Vice president of IT at a large grocery store chain (anonymous by request)*
(✓) ASSET () LIABILITY

"People who work at the same job for a long time get stuck in a rut. If you're a techie and you want to stay up-to-date, you practically have to job-hop. If you're changing every six months, there's a problem, but two to three years is pretty average for high tech."

— *Larry L. Presswood, chief technology officer at Vacation.com, a travel agency network based in Boston*
() ASSET (✓) LIABILITY

"If you've been at the same company for 20 years and you've always done the same thing, that's no good. But if you've been there for 20 years and you've moved around and done different things, that's good. If someone's moved around a lot, I'll always ask why. More than two or three jobs in a row of less than a year would be an alarm. If someone's on a different job every six months, let's face it, they're a contractor."

— *Cyrus Khoshnevisan, director of engineering at Palo Alto, Calif.-based Virtual Vineyards, which sells wine over the Internet*
(✓) ASSET () LIABILITY

"You can be as committed to a short-term project as a long-term project. It doesn't matter if they've been to a lot of different jobs — as long as they complete each job. Being at a job a long time doesn't necessarily mean they're a better or more loyal employee. This business today is project-oriented."

— *Darryll Pivec, a recruiter at Tampa, Fla.-based international IT recruiter Global Staffing Solutions Inc.*
() ASSET (✓) LIABILITY

"Our clients love stability, because it shows their employees will stick around. In this economy, it's not uncommon for people to move around — but someone who's spent less

than a year in each job is still probably not as attractive a candidate."

— *Pam Claughton, a recruiter at Hollister Associates Inc., a Boston-based placement agency*
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"It is a red flag if the person has been an employee at different companies and has jumped without completing major projects or implementations, as it may be indicative of a lack of technical depth. The fact that someone has been with one company for a long period of time shows stability, but we always dig deep into the types and complexity of projects they've completed to make sure that they have kept up-to-date on the latest technologies."

— *Rebecca Lonergan, director of staffing at San Jose-based online auction giant eBay Inc.*
(✓) ASSET () LIABILITY

"I prefer people to be stable — say, two to three years at a job."

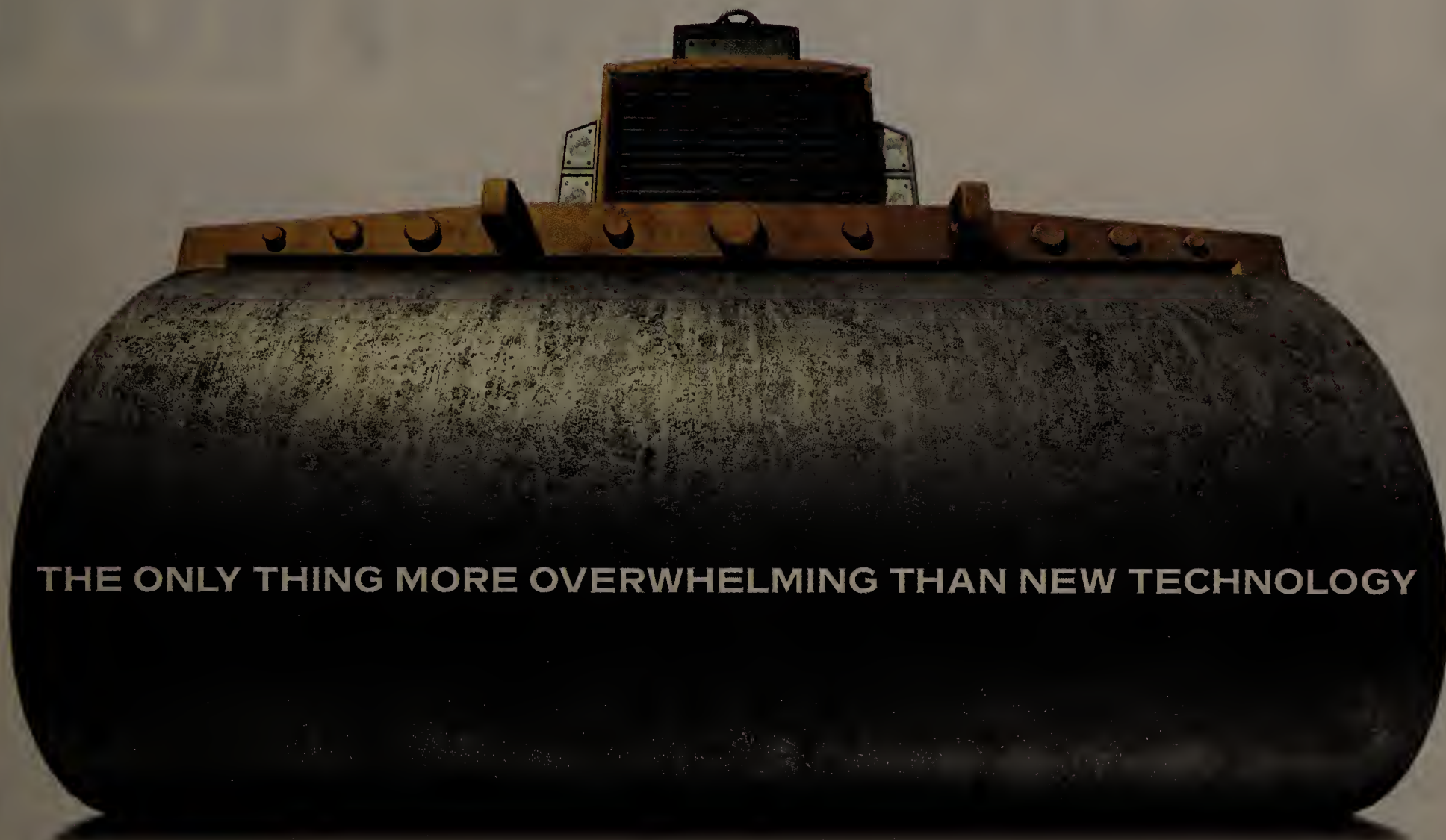
— *Nancy Young, a recruiter at The Norland Group, a San Carlos, Calif.-based IT recruiting firm*
(✓) ASSET () LIABILITY

"I like people who have moved around a lot. . . I also like people who have been in the same place for a while but with a lot of titles. In this business, technology changes so fast that I don't want people who have been doing the same thing for a long time; I want people who are flexible and have done lots of things."

— *Jeremy King, director of technology at Petopia.com, a San Francisco-based pet care start-up*
() ASSET (✓) LIABILITY

Fitter is a freelance writer in San Francisco.





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IT on the Net Frontier



Life in the IT group at a dot-com is a wild ride, where speed is the goal, change is the vehicle and the rules are made up as you go along
By Kathleen Melymuka

ANN DELLIGATTA learned quickly that life as chief technology officer at Autobyte.com Inc. would be different. "When I came here with my mainframe background, I went to the CIO and said, 'I think I know the answer to your problem: You've got 10 Priority 1 projects. You need to prioritize them and make a queue.' And he said, 'Excuse me, that's *your* problem. *You* have 10 No. 1 priorities. Deal with it.'"

E-commerce changes all the rules. No wonder Americans are nuts about it. In a country where the sustaining metaphor has been the frontier, the Internet has instantly transformed a been-there, done-that business landscape into a vast, untamed wilderness with no culture, no maps, no rules and no limits. Information technology on this frontier is evolving through trial and error and shaping a culture of speed, risk-taking, customer focus and a nearly organic integration with the business.

A look at four trailblazers reveals how they achieve that Internet speed, attract first-rate talent, handle continuous change and leverage both conventional wisdom and e-commerce technology through their businesses — and where they've taken wrong turns. Those who follow can use these lessons to smooth their own trails.

No Waiting

"Time is the enemy," says Debra Chrapaty, president of **ETrade Technologies**. Sure, speed is important in any IT organization, but Internet speed is something else. That's why Delligatta got such a rude awakening when she broached the idea of a queue. Her CIO was just clueing her in to the cowboy code: no backlogs in e-business. If that means bending a few rules and cutting a few corners, so be it.

Nowhere is the speed of e-commerce IT as apparent as in a start-up. In January, a small team at Bank One Corp. in Chicago was charged with building a full-service online bank that would operate as a subsidiary. They used an "outlaw" metaphor to get themselves thinking outside the vault. "We treated it as if we were five guys in a garage, because five guys in a garage will come up with a better mousetrap," says Bill Wallace, who would become CIO of **Wingspanbank.com**, in Wilmington, Del.



The group threw out convention and put together a short list of e-commerce

Continued on page 56

We bring in the best people who are really jazzed up to build a company as opposed to maintaining one, and we allow them to use their creativity. That's why many of the dot-com companies have such an ability to get this great talent.

DAVID LORD (ABOVE), CEO,
TOYSMART.COM

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A Look at IT at Four E-Commerce Companies



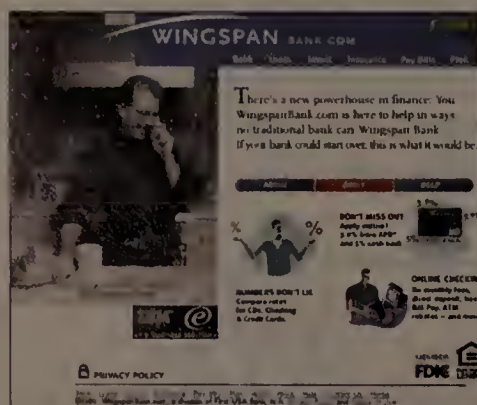
AUTOBYTEL sees a stronger link between IT and the business units



WITH NO BRANCH OFFICES to worry about, the IT group at ETrade focuses on the customer Web site



TOYSMART.COM keeps its IT and e-commerce functions separate



WINGSPANBANK.COM put senior project managers in charge of different IT areas

product vendors almost instantly.

"Companies waste a lot of time selecting vendors," Wallace says. "If you survey five industry people for their top vendors, the same two or three names appear on every list."

By February, the group was ready to build the bank. They met with vendors to finalize hardware and software choices and simultaneously put the company together. The team started development immediately. Testing was completed in April, the site opened to "friends and family" in May, and Wingspanbank.com went live in June. Then, says Wallace, "our perspective was, How do we push that kind of speed back into the [IT] organization?"

The initial answer was to go with what worked at the start. When they put the bank together, each member of the group of senior project managers was given start-up responsibility for an IT area such as networks, servers, the Web site or release management. Each herded his vendors through product development, integration and testing and continues to oversee his particular area, including responsibility for quality assurance as well as project and contract management.

Plenty of People and Parallel Processing

Like the frontier sheriff who's also the blacksmith and the doctor, Wallace and his staff tend to wear many hats. He serves as executive vice president, CIO and temporary director of development, a position he held previously at Bank One's First USA subsidiary. His chief technology architect doubles as head of operations.

This kind of staffing reflects a preoccupation in Internet IT with doing many things simultaneously. Toysmart.com Inc., for example, has an extra-large ratio of project managers to staff to allow for parallel processing of projects. The theory is that just as parallel processing outpaces sequential processing in a computer, parallel processing within a project will speed completion.

When a project is split into sections that are run by several project managers simultaneously, it can be completed faster than when a single project manager works on the sections sequentially. Similarly, rather than handing off a completed system for quality assurance testing, the quality assurance engineers at the Waltham, Mass., online toy retailer sit with the developers and test system segments on the spot as soon as a piece is ready. "Then the enterprise test runs a lot faster," says CIO John Puckett.

A Talent Magnet

These approaches require an abundance of talent that would be very difficult for a traditional company to snag and keep. But the pure e-commerce environment acts like a talent magnet,

says Toysmart CEO David Lord. "What I perceive as one of the greatest benefits is we're building from the ground up," he says. "We don't have to retool. We bring in the best people who are really jazzed up to build a company as opposed to maintaining one, and we allow them to use their creativity. That's why many of the dot-com companies have such an ability to get this great talent."

But high spirits and talent aside, the breakneck pace of e-commerce heightens the danger that core skills and processes might be shortchanged. Autobytel.com's Delligatta, who came up in a mainframe environment and previously served as general manager of IT services at TRW Information Systems and Services, is careful to balance the enthusiasm and speed of her new-skills people with perspective born of experience. "We had a bunch of folks who grew up in this space and have never worked on a mainframe," she says of the Irvine, Calif., online automobile marketing service. "So we also brought in some people who had been in a little more structured environment. We selected people who would understand that we wanted a facilitating structure, not a debilitating structure." Those are the people who handle key areas such as quality assurance, she says.

Change Is a Given

A year or so down the line, Wingspanbank's Wallace foresees a major reorganization for his IT group. At that point, he'll set up a more traditional structure with an IT relationship manager and a project manager for each business unit, such as marketing, finance and credit, as well as centralized IT services to which any unit can subscribe.

"Wingspan will evolve to that model as we grow," he says. Wallace's future model for Wingspan looks something like the current one at ETrade Technologies, the IT branch of ETrade Group Inc., which includes the Menlo Park, Calif., online brokerage.

When Chrapaty arrived two and a half years ago, IT was organized around traditional functions such as application development, operations and infrastructure. She reorganized it into separate groups tied to products and services (such as retail and institutional securities trading and international transactions), with a common infrastructure and operations group as a foundation. Each product group reports to Chrapaty and a business unit CIO.

The product model is fairly common in financial institutions. What's different at ETrade is the products and services themselves. For example, in a traditional financial institution, the retail IT group would be working on systems to be deployed to branch offices. Here, there are no branch offices; the retail IT

group works on the customer Web site.

Chrapaty's organization will be morphing again soon, she says. As ETrade services become available at any time and place on any device from Palm-Pilot to TV, the IT organization will have to change from its current product-aligned model to one that focuses on the types of devices that deliver the service.

Best of Both Worlds

Like the frontier preacher holding church services in a saloon, the Internet frontier often juxtaposes the traditional and the radical. Sometimes the same IT organization can look radical from one angle and traditional from another.

Toysmart, for example, has taken the somewhat unusual step of separating e-commerce from IT. Chief E-Commerce Officer Mark Reese, who hails from Andersen Consulting, oversees Web design, development and imaging (graphical representation of products on the site); merchandising; fulfillment; customer care; online content; and Web research. "It's important that one person own all that with a single focus on 'Will this improve the customer experience?'" he says. "If not, it shouldn't be a priority."

Meanwhile, CIO Puckett, former CIO at GTE Corp., runs the IT shop that looks at more traditional concerns such as networks, architecture, infrastructure, process engineering, business applications, integration and security. "Having separate organizations for each of the tasks at hand allows us to move at the speed of light," says Lord, himself a former CFO and CIO. For example, Toysmart has redesigned its site twice since January, and it recently built a 126,000-sq.-ft. fulfillment center, from physical construction through the implementation of a warehouse management system in less than 80 days. "When we hit the ground, we're not running," says Reese. "We're sprinting."

That's because e-commerce, as IT's priority customer, doesn't have to compete for IT resources the way various business units of a traditional company do, says Puckett. But when you look at it that way, the new structure looks awfully familiar. In fact, Lord even compares his IT/e-commerce setup to that of the most traditional of companies: an automaker. "When you think of Chrysler, there's the technology infrastructure and the production facility manufacturing that car," he says. At Toysmart, the product is e-commerce, and the IT/customer structure "allows us to focus all our resources with a laser vision," Puckett says.

Too Much Focus?

But some on the e-commerce frontier have found that a laser focus can burn



ALAN LEVENSON

you. Delligatta, for example, discovered early on that the e-commerce people at Autobyte were drafting folks from other IT areas who had a particular expertise they needed, leaving the meat and potatoes of IT understaffed and vulnerable.

Delligatta put an end to that by setting up a separate, untouchable team that works strictly on internal projects and operations. "We focused on ourselves as well as our customers," she explains. "We stopped the borrowing."

Both the internal and external IT teams at Autobyte work with the business in a way many traditional IT shops would recognize, using an IT manager and a business manager on every project.

But Delligatta, who is now chief operating officer, maintains that the relationship between business and IT is closer and better integrated in e-commerce companies.

"When I look at my previous years in IT, there was the business and somewhere under there was technology," she says. "In an Internet company, there's a much stronger marriage."

Even in the Internet world, some

things remain constant, and outsourcing strategies seem to be comfortably familiar. IT shops in pure Internet companies, like their traditional counterparts, are fairly sanguine about outsourcing what they see as near commodities, such as Web hosting, but they're adamant about keeping control of their strategic systems.

Autobyte, for example, has outsourced a shopping page. "We could create a whole shopping system, but what's the value? They exist," Delligatta explains. In-house development is reserved for strategic systems or those closely tied to their vertical niche, such as the wholesale auction Autobyte recently developed.

"You may think auction software is easy to pick up," she says, "but it's a lot easier to auction an Elvis record than to auction a car, and we know more about all the features that make our dealers' jobs easier."

Life on the Edge

There's no question that IT on the Internet frontier means living on the edge. "Speed is crucial, flexibility is crucial and it's crucial to be at the lead-

ing — and often the bleeding — edge," says Puckett. That attitude makes them risk takers and icon breakers, willing to pare processes for speed and use technology in new ways to benefit their businesses.

Not Just for Customers

Delligatta's group, for example, has designed its own scaled-down intranet project management system that uses a Web page to quickly capture requirements that could have taken months to nail down in the mainframe world.

She says one of the greatest lessons traditional companies can learn from e-commerce companies is that the Internet isn't just for customers; you can use it to run your whole business better.

"This is the great open system we were all searching for all those years," she says. "We have the ability to cooperate easily with other companies. Projects that would have taken years and years ... can now be done very quickly together."

"Everyone is looking at e-commerce," she concludes, "but they ought to look at how the Internet can enable entire business systems." ▀

When I look at my previous years in IT, there was the business and somewhere under there was technology. In an Internet company, there's a much stronger marriage.

ANN DELIGATTA (ABOVE), COO,
AUTOBYTE.COM

Infomediary

BY JULIA KING

THANKS TO the Internet, there's no longer any such thing as a limited selection.

Whether you're shopping for a house or a car or a loan to help pay for them, you can point and click through hundreds of Web sites to find a product or service that suits your needs.

But who has the time? And even if time weren't an issue, how can consumers compare the slew of offerings in any given product category?

"One of the key values of the Internet is that it has eliminated shelf space as a constraint, so customers are presented with a set of infinite options," says John Hagel, who coined the term *infomediary* and co-authored the book *Net Worth* with fellow McKinsey & Co. consultant Marc Singer.

"Even though we have search technologies and agent technologies, they have nowhere near the capability to make sense of it all," says Hagel, who leads McKinsey's global e-commerce practice in San Francisco.

This is precisely where infomediaries like Irvine, Calif.-based Autobyte.com Inc. and Los Angeles-based BizRate.com come in.

At Autobyte.com, customers can point and click their way through detailed information on all makes and models of cars. They can also access independent reviews, safety records, pricing lists and other data.

Once they're ready to buy, customers can specify the car they're looking for and the price they're willing to pay. Autobyte.com then matches those requirements with an accredited Autobyte dealership capable of fulfilling them. Within 24 hours, it puts that dealership in touch with the prospective buyer.

From an information technology standpoint, "we have to struggle all the time to provide unbiased content and put data in terms such that consumers can compare apples to apples," says David Grant, chief tech-

DEFINITION

An infomediary is a new Internet business model that applies to firms that help customers deal more efficiently and effectively with online vendors. In e-commerce, it functions as a third-party provider of unbiased information and as a business matchmaker. An infomediary also provides vendors with consumer information to help them focus on products and services customers want.

ology challenge, according to Henri Asseily, chief technology officer at BizRate.com.

BizRate.com continually collects customer feedback about their online purchases and then provides online vendors and potential customers with that data.

"What we do is allow customers who actually shopped at vendors to provide us and the rest of the Internet community with information about what happened during their purchase," Asseily explains.

In the past three years, BizRate.com has assembled a detailed database of more than 500,000 online buyer survey responses, which consumers can access for free.

Yet "the trick is not just to pass information from one party to another, but to add value to it," notes Asseily. One way BizRate.com does this is by using proprietary software algorithms to pinpoint e-commerce buying patterns for online vendors that subscribe to the service.

Oak Brook, Ill.-based Xolia.com, another infomediary, provides online customers at its Web site — and other branded financial services sites — with software-based tools for selecting an online broker.

Online companies such as The Motley Fool Inc., for example, could use Xolia's software to give Motley Fool users a tool for finding the best online broker for them.

"A good infomediary doesn't just offer information, but a way for users to leverage that information in a way that's personalized," notes Xolia.com CEO Anas Osman.

"We're an infomediary and also an enabler of infomediaries," says Osman, who foresees a trend toward branded sites in different vertical industries offering more infomediary services.

The one function you won't see infomediaries take on is selling or otherwise acting directly on behalf of a vendor. This is because the true value of an infomediary lies in its neutrality. In fact, privacy-conscious customers are freed from disclosing information about themselves directly to marketers. But through an infomediary, they can receive highly personalized service from online vendors.

Consider New York-based Cybersettle.com Inc., an online site for settling disputes such as workers' compensation and personal injury claims. An insurance company enters information about a claim it wishes to resolve, including the amount of money it's willing to pay.

Cybersettle.com then notifies the other party, which sends back the amount it will accept to settle the dispute. Cybersettle.com compares the two figures. If they fall within a range that has been preapproved by both parties, an online settlement is reached.

Sure, an insurance company could set up a similar system, says Richard Schnoll, an attorney and vice president at the 2-year-old company. "But it would never work because a plaintiff or a plaintiff's lawyer would never enter their demands into a system run by an insurance company. They wouldn't trust it. But we're a third party that's neutral," Schnoll says. So far, Cybersettle.com has processed more than 4,000 claims, he says.

For now, most infomediaries derive their revenue from transaction fees, market research services and targeted marketing consulting, all aimed at online vendors, mostly in the business-to-consumer marketplace.

But Hagel says that over time, he expects customers will also be willing to pay for services as they become more aware of the value infomediaries offer. He says he also expects more infomediaries to pop up in the online business-to-business arena. ▀

How to Use BizRate.com

Visit www.bizrate.com and you instantly have information about hundreds of online stores and what thousands of previous shoppers at those stores think about them.

Looking to buy a Miles Davis music CD, I entered *CDnow.com* at BizRate.com's Rapid Reports section. What I got back was an overall customer satisfaction rating of four and a half stars out of a possible five. I scrolled down farther to find individual ratings of the online music store's product selection, pricing, customer support and on-time delivery record. As of Oct. 19, the rating was based on reports from 22,034 shoppers who had already been to the CDnow site.

BizRate.com users who don't know the name of an online music retailer can go to the site's cate-

gories section. Here, I typed in *music* and was given the choice of shopping by product, store or personal preferences. I wanted to pay by check and receive my CD the next day. Two sites — *Cdconnection.com* and *Playback.com* — met my criteria. The first had been reviewed by more than 1,200 shoppers. The other had received 911 reviews as of Oct. 22.

Elapsed time: less than one minute. — *Julia King*

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We rate e-business.

Report for: CDNOW

Customer Certified Performance Report

Overall Rating: 4.5 out of 5 stars

Number of Reviews: 22,034

Product Selection: 4.5 out of 5 stars

Rate of Delivery: 4.5 out of 5 stars

Customer Support: 4.5 out of 5 stars

On-Time Delivery: 4.5 out of 5 stars

Product Representation: 4.5 out of 5 stars

Customer Satisfaction: 4.5 out of 5 stars

Shipping & Handling: 4.5 out of 5 stars

Rated by 22,034 customers as of 10/22/99

bizrate.com
We rate e-business.

State a Description

nology officer at Autobyte. That means modeling data from thousands of dealers in such a way that it can be comparatively analyzed. For example, "if you're looking for a sport utility vehicle, we need to make sure that you don't miss an [available]

SUV because a dealer is marketing it in another way," Grant explains.

By their nature, infomediaries are organizers and manipulators of vast amounts of data, which is perhaps their greatest information technol-



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THE NEWSPAPER FOR IT LEADERS

*Publisher's own data as of 5/31/99.

Dear Career Adviser:

I have more than two years' experience with Internet marketing and Web design. I have worked with HTML, JavaScript [and] Common Gateway Interface (CGI) script. I'm now looking to change jobs, [but] I'm confused how to update my résumé. Do I concentrate on projects

I created and designed or the skills I used to complete the task? For example, I created an online product catalog using HTML, JavaScript and a CGI form that will lead to the launch of our online store. While this might not mean much to a potential employer, my staff uses it daily.

— RÉSUMÉ-CHALLENGED

Dear Challenged:

Your in-house product catalog may lack some parts of the e-commerce equation that show you have experience with order processing/tracking systems, credit-card transactions and secure servers. But the fact that you've completed this online project is much more important than whether it's for in-house use or posted on an Internet site, says Laura M. Owen, vice president of human resources at Women.com Networks Inc. in San Mateo, Calif.

On your résumé, be sure to

list the projects you've created and designed that show you have the knowledge to work on the front end of a project and also the programming. Also list the tools you've used to get the job done. Including keywords like CGI scripting will help employers find you when they're searching for someone with specific skills. And take the advice of Julie Smith, director of human resources at JobOptions LLC: "[Challenged] should be clear about whether she wants a technical or a managerial position. If she is seeking something higher-level, she should focus on the strategy of the online store, vs. the tactical way that it was constructed."

Dear Career Adviser:

I'm employed full time as a programmer, but I want to start my own e-commerce site. However, with only a few thousand dollars to invest, I'm

not sure I have enough resources to be successful. Any ideas? — GOING PUBLIC SOON

Dear Going:

Dot.com companies are going public at the rate of 30 per week. Money to fund these ventures is plentiful, and new hires flock to prepublic organizations for their stock upside. But to compete, you'll need millions, not thousands, to start now, and you'll need to meet major milestones in increasingly compressed time frames.

You're probably better off joining a seed organization with a good idea that's already funded and has some sustainable competitive advantage. Stay away from companies

running on razor-thin margins, and follow this advice from Jenn Fonstad at the Redwood City, Calif., venture capital firm Draper Fisher Jurvetson: Focus on firms developing business-to-business solutions, infrastructure or back-end tools. Look for experienced managers with a history of success who are nimble at responding to competition, accessing capital and creating powerful partnerships. Getting several thousand shares of stock from a sustainable organization ready to launch an initial public offering could be more profitable than starting your own.

Dear Career Adviser:

I'm a senior member of an information technology organization that's getting rid of titles and moving to a role-based banded organization. So instead of a title, I'll be clumped together with other people, grouped according to a few roles without traditional title differentiators such as junior and senior.

I'm concerned about the way this will affect me as I market myself into a new job outside my current com-

pany. What do you think?
— NAME, RANK AND SERIAL NUMBER

Dear Rank:

Truthfully, I would worry about being part of an organization that's spending so much time on this, because no matter how "role-based" an organization wants to be, companies and departments still need some sort of hierarchical organizational and title structure to clarify the broader organization and identify its team players and specific roles and functions. Therefore, if you're trying to move into a new job function outside your organization during this title-less time, be sure to write on your résumé the equivalent job titles you would have held in a traditional organization and detail your technology background and management functions to substantiate them.

"Everyone is a salesperson at some point in their career," says Devin Downey, director of business development at the Sausalito, Calif., office of TMP Worldwide Inc., a recruitment advertising agency. "Whether you're selling your talents and skills internally or externally, job titles provide a point of reference for the marketing of a person's career." In short, your situation sounds like 1984 all over again. ▀



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

BRIEFS

Russian Y2K

A delegation of high-level Russian officials will soon meet with the U.S. Senate's year 2000 committee to discuss Y2K issues, including defense-related problems. They're expected to seek financial help from the U.S. to help pay repair costs. The meeting with the Russian delegation, which will include members of Russia's parliament and a deputy prime minister, is expected to occur within the next two or three weeks.

Healthy Site

Health information Web site drkoop.com, led by former U.S. Surgeon General Dr. C. Everett Koop,

recorded 14.7 million page views for September, a 12% increase over August page views, officials said. September reports from PC Data Inc. and Media Metrix Inc. both ranked drkoop.com as the No. 1 dedicated health Web site in September.

Self-Serve System

T. Rowe Price Associates, a Baltimore-based provider of mutual funds, has selected a Web-based, self-service human resources system from Authoria Inc. in Waltham, Mass. T. Rowe Price plans to install the system over its intranet, providing its 3,500 employees with access to a repository of benefits, payroll and human resources information.

Y2K Contingency

Nearly four out of five companies haven't completed year 2000 contingency plans, according to a study from Cutter Consortium in Arlington, Mass. Slightly more than half of the 96 organizations surveyed have conducted Y2K testing, while 40% said their companies have finished installing and testing systems for Y2K readiness. The organizations polled have an average annual information technology budget of \$38.2 million and an average of 816 staffers.

Global Transactions

Houston-based Enron Corp. said it will launch a global, Internet-based transaction system for trading wholesale energy and other commodities at the end of this month.

Users will be able to view commodity prices in real time and transact business directly over the Internet without paying a commission fee. The system, known as EnronOnline, will go live Nov. 29 with natural gas trading. Other products will follow over the next six weeks, Enron said.

Contractors Unite

The Washington Alliance of Technology Workers, which represents contract workers at Microsoft Corp., has accused the firm of violating a state labor law that requires employers to make personnel files available to employees and to give them the opportunity to dispute irrelevant or erroneous information. The alliance is encouraging members to demand their job evaluations and to file labor grievances with the state if the requests are denied.

Money Mapping

ERI Economic Research Institute in Redmond, Wash., recently released data on the mean salaries for webmasters in six major cities: Seattle, Los Angeles, Denver, Chicago, New York and Boston. Of those six, New York offers the highest mean salary for both webmasters with one year of experience and five years of experience, at \$55,299 and \$66,876, respectively. The lowest mean salary for webmasters with one year of experience or five years of experience out of those six cities was in Denver, at \$49,739 and \$60,693, respectively.

The national mean annual salary for webmasters with one year of experience is \$49,150. For five years of experience the mean is \$60,296, and for 10 years of experience and up, the mean is \$72,546.

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A close-up photograph of a man's face, looking directly at the camera with a serious expression. He is holding a white-bordered photograph in front of his chest. The photograph shows a vineyard with rows of grapevines and a man in a dark suit walking through the rows. The background of the main image is a plain, light-colored wall.

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A WORD ABOUT THE NEW MANAGEMENT TEAM: **ATTITUDE**



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TECHNOLOGY

EASY 3-D

A new online service from Spatial Technologies promises to make it easier for companies to share 3-D engineering models. The service (www.3dmodelserver.com) has helped reduce the time it takes for such translations by up to 40% on average, the company says. ▶ 64

OPINION

Novell's pitching the specs of its network software to technical experts, while Microsoft preaches business benefit to end users. Guess who'll win? asks technology editor Robert L. Scheier. ▶ 64

JACK-OF-ALL TRANSACTIONS

ClearCommerce Corp. sells a secure transaction processing system to handle virtually every aspect of online buying and selling. But the real beauty of the ClearCommerce Merchant Engine is its high degree of flexibility — and a nice combination of fraud-prevention tools. ▶ 66

PINT-SIZE PIXELS

Digital camcorders are coming in smaller packages, but the cost and learning curves are fair-

ly steep. We look at products from Sharp, Canon and Casio. For the most part, we aren't terribly impressed. ▶ 68

QUICKSTUDY

Look to the Wireless Application Protocol de facto standard if you want to write Internet-enabled apps that run on small wireless devices. ▶ 69

FLASHBACK

The millions of Web surfers who logged on for the NetAid concert Oct. 9 owe a debt of gratitude to a meeting of the Internet Engineering Task Force in 1992. It was there that a successful demonstration of IP multicasting took place over the Mbone. ▶ 76

SKILLS REDUX

IT projects that were set aside during the Y2K scramble are again coming to the fore. Look for areas like e-commerce and converging technologies to revisit IT consciences with a vengeance. Some experts predict that over the next few years, those projects will require 10 times more brains and bodies than anyone ever anticipated. ▶ 78

MORE

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SCOTT CEBULA, executive director of information services at MemorialCare, opts for broadband access for his telecommuters whenever possible because "much of the support burden reverts back to the [cable modem] provider"

ALAN LEVENSON

WHERE ARE YOUR WORKERS?

ELEVEN MILLION U.S. EMPLOYEES telecommute — about 6% of the workforce — and that percentage is expected to double by 2005. Get ready. Carefully planned telecommuting programs widen the reach of staff resources; poorly planned programs are a support nightmare. We look at companies that have successfully run the remote-access gauntlet and a few of the technologies that helped them do it.

70

Editor's Note: Readers will notice a small change this week: We have done away with the "Hardware," "Software" and "Networks" labels on pages in the Technology section. These labels have become less useful with the passage of time and the emergence of new technologies. We will continue, of course, to cover the products and technologies most crucial to you. E-mail me at robert_scheier@cw.com and let me know how we're doing.

— Robert L. Scheier, technology editor

BRIEFS

Sun Gives Out Code

Sun Microsystems Inc. last week announced the release of the source code of Java Server Pages 1.1 and Java Servlets 2.2 technology to the Apache and Java developer communities. The code is currently available in beta format at <http://jakarta.apache.org>.

Intel to Release Digital Modem Card

Intel Corp. has announced a digital modem card that doubles the analog call capacity of its LanRover Access Switch and a LanRover concentrator box. The card will extend switch call capacity to 144 ports, up from 72, and the concentrator's capacity to 48, up from 24. Pricing for the card, which will be available this month, starts at \$7,500.

AOL, OpenTV Team Up To Create TV Software

America Online Inc. in Dulles, Va., has invested in OpenTV Inc. in Mountain View, Calif., as part of an agreement to jointly develop interactive TV software for AOL applications. The companies plan to add AOL features, including e-mail and instant messaging, to OpenTV's set-top box software, AOL said in a statement.

GemStone Upgrades GemStone/J Server

GemStone Systems Inc. in Beaverton, Ore., last week announced an upgrade to its GemStone/J application server that integrates Sun's performance-boosting HotSpot engine 1.0.1. Pricing for development licenses for GemStone/J 3.1, scheduled to ship later this month, start at \$4,995.

Neon Touts Database

Neon Systems Inc. in Sugar Land, Texas, last week announced general availability of its Shadow Java Database Connectivity drivers for its Shadow Direct 4.5 software. The drivers will let Java Web-enabled applications access IBM's System/390 data and transactions.

CAD/CAM Models 'Healed' Across Platforms

New service lets companies share 3-D data

BY JAIKUMAR VIJAYAN

Call it an online repair service for 3-D model data.

Spatial Technologies Inc., a Boulder, Colo.-based vendor of tool kits for developers of computer-aided design and manufacturing (CAD/CAM) software, has launched a service for "healing" and translating

complex engineering drawings from one CAD/CAM design format to another.

The service promises to make it easier for companies to share design data across multi-vendor platforms. The task is time-consuming because of interoperability problems among CAD/CAM packages.



SPATIAL TECHNOLOGIES has developed a service that lets companies share 3-D design data across multivendor platforms

For instance, a model developed using one design software is often rendered incomplete or "damaged" when opened in another platform. Fixing it requires engineers to manually re-enter missing attributes or correct corrupted data.

Spatial's service has helped reduce the time required for such transformations by up to 40% on average at Troy, Mich.-based Woodbridge Foam Corp., said Dan Virga, Spatial's design engineering supervisor.

"There are instances where the time taken [to translate documents] has been reduced from four days to four hours," Virga said.

Woodbridge is one of the largest suppliers of foam for automotive seating and energy management. It receives data transmitted from auto manufacturers worldwide, most of it in formats very different from its own Unigraphics Solutions Inc. design system.

Spatial's service lets companies like Woodbridge submit such models to its Web portal site (www.3dmodelserver.com), where the design is healed and

translated into the desired format. At the core of Spatial's service is a set of transformation tools that the company soon plans to sell separately.

Drawings submitted to Spatial's Web site in formats like the Initial Graphics Exchange Specification and the Standard for the Exchange of Model Product Data graphical file formats are translated into Spatial's ACIS Save File format, which can be downloaded by the customer.

If a customer's platform doesn't support Spatial's standard, the models are again converted to the desired format.

"The result is that the designs come out much cleaner, and we spend much less time sewing together the models" needed for costing purposes, Virga said.

Repairs can include getting rid of things like redundant attributes, extra edges or faces that don't meet at an edge, said Isaac Kato, Spatial's director of Web strategy and development.

Customers are charged \$20 for every megabyte of data healed. Typical drawings range from a few hundred kilobytes to 20M bytes. Repairs "can vary very widely," depending on complexity, Kato said. ▀

ROBERT L. SCHEIER

'If it feels good, buy it'

EVEN WHILE being grilled in front of thousands of potential customers at Gartner Group's Symposium/ITxpo last month, Novell Chairman and CEO Eric Schmidt kept his cool. Why, a Gartner analyst asked, are so many customers choosing Windows NT (and Microsoft's forthcoming Active Directory) as the foundation for their networks, rejecting Novell Directory Services without so much as a formal evaluation?

One could almost hear Schmidt sniff with contempt. For those customers who do a head-to-head comparison, the "gap" is clear: "Our product exists and theirs doesn't," he said. While Microsoft is "an incredible marketing machine, we are specialists. The people who are our customers know who we are. Our strategy is to make sure the people who know us get listened to."

Translation: The networking geeks in the back room will

prevail over the suits in the front office who read Microsoft ads.

Ouch. IBM tried the same tactic with OS/2 for years, trumpeting its supposed technical virtues over Microsoft Windows. Microsoft, meanwhile, built customer demand for Windows, courted developers to write popular applications for it and rolled out "good-enough" versions of Windows until it owned the desktop. Now Microsoft is do-

ing the same thing on the server, with what looks like the same results.

Safe Strategies

In many companies, buying all-Microsoft has become the safe strategy, much like buying all-IBM was a generation ago. None of the individual products may be best of breed, but the vendor will make them all work together. . . sort of, and someday. And if the vendor can't make good, well, you won't look too bad because all your competitors made the same, "safe" choice.

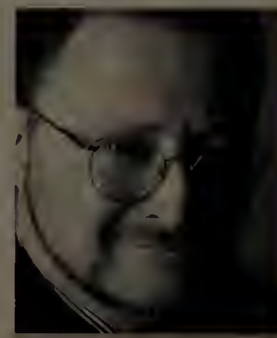
Gartner went so far as to predict that "end-users' per-

ception of operating systems platforms' suitability for Web applications [that is, the 'coolness' factor] will be a more significant driver in platform selection than base functionality through 2004."

Customers, Gartner soberly advised, "need to recognize emotional factors as a critical part of platform selection . . . and balance the emotion with legitimate functional business needs."

If only the world worked like that. When it comes to marketing vs. technology, marketing usually wins. Unless the company starts making more of a business pitch to end users, Novell could be-

come only a niche provider of high-end network software (and ripe takeover bait), while Microsoft continues to own more and more of the enterprise. ▀



ROBERT L. SCHEIER IS Computerworld's technology editor. He can be reached at robert_scheier@computerworld.com.

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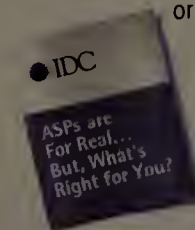
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Do You Know Who's Minding the E-Store?

ClearCommerce's Merchant Engine offers secure online transaction processing

BY CYNTHIA MORGAN

ANYONE can have an electronic storefront. But an electronic storefront with fraud-proof financial transactions? Now there's a challenge.

ClearCommerce Corp. sells Merchant Engine, a modular and surprisingly open electronic transaction processing system for the back end of commerce Web sites. The software fills cash boxes behind Web sites like Hewlett-Packard Co.'s Shopping Village, online stock broker TheStreet.com and the green-thumbed Garden.com Inc. And now that ClearCommerce has entered the application service provider arena, hosting its own product in a rapid deployment scheme, it should be on the viewcreens of anyone building a commerce site.

Credit-card fraud is a massive online headache, one that can shift commerce sites from moneymakers to money-losers if the fraud exceeds the generally acceptable range of 0.5% to 1.5%. A fraudulent credit-card transaction not only costs merchants the price of the stolen goods, but can also add \$5 to \$50 to the cost of the transaction in banking penalties, labor costs and shipping charges.

ClearCommerce started in 1995 as OutReach Communications. In 1997, it got a facelift, first-round funding from powerhouse venture capitalist Austin Ventures and a name change. Austin also put two of its own — Tandem Computers Inc. founder James G. Treybig and financial industry veteran Robert J. Lynch — in the chairman of the board and president/CEO spots and keeps a tight rein on the company, according to industry reports.

The company's flagship, Merchant Engine, offers a good roster of services for the corporate commerce site manager. It manages credit-card screening,

offering antifraud tools to help stop a bad credit card before it reaches the bank and incurs a 30- to 50-cent charge. It also handles tax calculations; delivery of digital goods like software, images and music; and control of shipping schedules.

But Merchant Engine takes a slightly different route than most of its rivals: The product is built more like a network

management tool than an independent financial system. It's modular and runs on Windows NT and Unix platforms, so information technology departments can use it with the transaction pieces they may already have onboard. It supports Simple Network Management Protocol (SNMP), so it can be tied into enterprise network management tools such as Hewlett-Packard's OpenView.

ClearCommerce offers an open application programming interface (API) that can ease the hassles of linking it to

established internal software.

Still, a full-transaction system can take months to install and fine-tune. ClearCommerce will host Merchant Engine for the customer in its own version of application service providing called QuickStart that lets companies wean themselves from ClearCommerce servers.

HP used QuickStart to get transactions moving on its massive HP Shopping Village (www.shopping.hp.com). Mike Bridge, the project's chief technology officer, said ClearCommerce's portion of the site was up in less than three months and scaled easily to match the site's 700% growth rate in the past 18 months.

ClearCommerce faces some daunting competition. But its modular approach is definitely on the right track. ▀



CLEARCOMMERCE co-founder Julie Ferguson co-developed Merchant Engine, a transaction processing system

ClearCommerce Corp.

Location: 11500 Metric Blvd., Suite 300, Austin, Texas 78758

Telephone: (512) 832-0132

Web: www.clearcommerce.com

Niche: E-commerce back-end transaction systems

Why it's worth watching:

ClearCommerce offers e-commerce transaction processing that thinks like a corporate enterprise, with open APIs to tie in outside enterprise resource planning and financial tools, support for SNMP and a modular approach. Its QuickStart program lets it offer these services as an application service provider, then helps the company move the system in-house once the dust clears.

Company officers:

• James G. Treybig, chairman of the board (from Austin Ventures)

• Robert J. Lynch, president and CEO (also from Austin Ventures)

• Julie Ferguson, co-founder, vice president, chief technology officer

• Riss Estes, co-founder, vice president business strategy, director

Milestones:

• 1995: Company founded as OutReach Communications

• 1997: First-round funding and a new name, ClearCommerce Corp.

• 1999: Second-round funding

• 2001: Projected profitability date

Employees: 110

Burn money: Austin Ventures, whose other projects include Garden.com, Tivoli Systems Inc. and content management software maker Vignette Corp., is a major investor and controls the two top positions in the company. ClearCommerce finished second-round

funding last year with additional investments from venture capital firms Internet Capital Group, Voyager Capital and New Enterprise Association as well as a buy-in from Intel Corp.

Customers: Many, including fast-growing commerce sites owned by Apple Computer Inc. as well as TheStreet.com and Hewlett-Packard's Shopping Village. Investor Intel will use ClearCommerce systems to provide back-end processing for its new service-provider sites.

Partners: Microsoft Corp., Sun Microsystems Inc., BroadVision, Visa and Chase Merchant Services

Red flags for IT:

• Cost: That easygoing modularity will cost \$75,000 for the basic Merchant Engine, a lot more if you need a high degree of customization.

• The right connection: It's possible — and tempting — to save money on a ClearCommerce installation by opting to connect through your site's existing Internet links. But because the whole schtick here is antifraud and pro-security, why risk it? Plan on an additional leased or dial-up line for the ClearCommerce connection.

• Missing standards? ClearCommerce supports the important protocols in transaction processing — SSL and Secure Electronic Transactions — but so far hasn't opted to support Mondex or SCMP. That's no big deal at the moment, but it could be if these standards take off.

[the buzz]
STATE OF
THE MARKET

Package Deals

Formerly hasty amalgamations of financial systems and Web authoring tools, Web transaction processing systems are evolving into complete e-commerce environments.

Open Market Inc.'s Transact processing system is one of the 800-pound gorillas in the market. Founded in 1994, the Cambridge, Mass.-based company has a broad reach that includes customers like Consumers Union (www.consumerreport.com) and Lycos Inc. in Waltham, Mass.

Transact is definitely the Ferrari of transaction processing, fast and powerful — but you'll pay \$125,000-plus just to get into its game. It's one of the few systems in this area that has announced support for the upcoming European electronic-wallet standard, Mondex.

Open Market's recent merger with FutureTense Inc., maker of the IPS content management and delivery software, is a strong move toward becoming a one-stop shop for commercial Web site management. The company also offers ShopSite, an electronic storefront system, and LiveCommerce, a cataloging tool. Of course, cradle-to-grave solutions may also make parts of your existing infrastructure redundant. ClearCommerce's open modularity could be a definite advantage here.

But it's still possible to choose among independent transaction processing vendors such as Mountain View, Calif.-based Verisign Inc. and Reston, Va.-based CyberCash Inc. They don't offer much in the way of fraud prevention, however.

CyberSource Corp.'s under-\$5,000 start-up price offers a reasonably complete payment processing and antifraud system, plus monthly per-transaction fees. The company recently fine-tuned its fraud screens, and it supports the Simple Commerce Messaging Protocol (SCMP), a Secure Sockets Layer (SSL) alternative that has been proposed to the Internet Engineering Task Force as a standard.

But CyberSource lacks many of the administration capabilities of big guns like Open Market and ClearCommerce, which may be one reason why it has been targeting small to midsize businesses. The company boasts some pretty big corporate customers — Casio Inc. (www.casio.com) is one — but its pay-as-you-go style works against the corporate megasite as it scales. And you may still need a third-party processor to interface with your bank.

COMPUTERWORLD
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companies

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Department of the
Information Services

**Recognition Application
Declaration of Profitable Sun Channel Partnership**

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ESM No. 42890

1999

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NO

Type or print your Sun Channel Partner's full name

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City or town, state, and ZIP code

Claim or Identification number (if any)

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(See worksheet below.)

Employee's signature

Internet Security Number

Date

\$

LIFE CHOICES

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COMPUTERWORLD
THE NEWSPAPER FOR IT LEADERS

Digital Video in Small Packages

BY RUSSELL KAY

REMEMBER the home movie drill? You had to wait until dark, then drag out an awkward, heavy, two-armed machine. You tacked a white sheet up on the wall, or maybe you had a separate screen that sometimes you could set up without help. Everyone in the family gathered in that darkened room while your father carefully threaded and rethreaded film through a maze of gears and levers, cursing under his breath, until finally you were ready to show four minutes' worth of film, just back from the processor.

That was the 8mm home-movie camera of my youth, for decades the only practical way for nonprofessionals to record moving pictures. Today, things are radically different, and for far fewer real dollars than the cost of that earlier 8mm camera and projector, you can get digital camcorders that record still and motion pictures and sound and that offer instant playback.

The ability to view moving pictures is one of the technologies that changed our lives in

this century. First, Hollywood's productions, then industrial and marketing films, then home movies. We're now at the beginning of a new era where we create and exchange full-motion videos over the Internet and use them daily for teaching, learning, marketing, planning and more to come. This new technology may be daunting to the gadget-challenged, but it offers a new

outlet for creativity, innovation and recording daily life. For the videophile in all of us, *Computerworld* checked out three new video devices — a true digital camcorder and two smaller cameras that can, within limits, record and play digital video. ▶

High Quality, High Cost, High Times

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Canon USA Inc.

www.canondv.com/ultura

If we computed a "gadget index" based on the number of features and functions, the Ultura digital camcorder would run away with the prize. Computer users accustomed to taking new gizmos out of the box without reading the manual are out of luck. There are so many different shooting modes, special effects and other options that you need to read the book.

The Ultura sports a 20x zoom lens, with digital magnification on top of that adding up to an overall 320x. I can fill the frame with an office clock nearly 100 feet away; its image is stabilized electronically and recorded onto a Mini-Digital Video tape cassette. You can compose your recording with an adjustable eye-level viewfinder or a color LCD panel that also plays back what you've recorded. This Canon is a powerful machine for beginning amateur filmmakers because there's a lot of powerful and relatively inexpensive editing software available to complement the high-quality video. In briefly reviewing this product, I couldn't begin to exercise all of its many features. Still, it did everything I asked of it without problems, and that's a rare occurrence. I've never



owned a camcorder before, mainly because nothing I've seen has interested me. Now, I'm tempted.

- RUSSELL KAY



It's a PDA; No, It's a Camera!

Casio Digital Camera Card JK-710DC for the Cassiopeia E-100 and E-105 \$299 (camera card only)
Casio Inc.
www.casio.com

Just about the time Handspring Inc. introduces its Visor (essentially a Palm III with a slot for assorted add-on hardware), Casio announces a digital camera that fits into the top-mounted compact flash (CF) slot of the company's Windows-CE driven color-screen personal digital assistant (PDA), the \$399 E-100 Cassiopeia. Though the Visor's slot has made a bigger splash in the news, the Cassiopeia's new camera card is just as significant in showing the capabilities of the CF format, which is built into most Windows CE computers as well as many digital cameras.

So the camera card is neat, but is it any good? Unfortunately, it's not. It will impress your friends, and it's certainly adequate for taking still pictures destined for the Web. But it's still much more a proof-of-concept demonstration than a practical device. With a full charge, Casio claims the Cassiopeia's lithium ion battery is good for recording 45 minutes of continuous MPEG-1 video. Sadly, that 45-min. spec is totally unreal. Installing the camera means you must remove any CF memory, so you're limited to the Cassiopeia's onboard memory. The E-100 I tested holds no more than 5 minutes of video, and that's assuming you've off-loaded your address book and calendar. No matter what I did, the camera invariably stopped recording after about 5 seconds. Many stand-alone digital cameras will also take such movies . . . and they do it better.

- RUSSELL KAY



Sharp Looking, Not So Sharp in Practice

Sharp Internet Viewcam VN-EZ1U
\$699

Sharp Electronics Corp.

www.sharp-usa.com

This 8-oz. camcorder was a real disappointment. I had visions of *Computerworld* reporters filming interviews at conferences and posting them to our Web site. With its 4x digital zoom and LCD display, the easy-to-use Internet Viewcam seemed perfect for the job. It captures sound and video remarkably well in MPEG-4 format. But 75 seconds of pretty-good video (320 by 240 pixels) uses every byte on the included 4M-byte SmartMedia memory card. A 32M-byte card held nearly 12 minutes' worth. File transfer is easy via the included floppy disk carrier. Four AA batteries deliver about 45 minutes of constant use.

Though the camera is neat, there's no good way to edit its video, and that makes it almost useless for real work. You can't name or edit videos in the camera, and the included software, PixLab Media Browser, can't improve image or sound quality (or do much else). The built-in microphone aims off to the left, and you can't use a separate directional microphone. I tried every tool I could find to convert Viewcam files to an editable format. Nothing worked, and Sharp didn't respond to questions. The Viewcam is fun to play with, a great gadget for making quick video clips. But it's an expensive toy of limited usefulness, and no bargain. - CYNTHIA MORGAN

WAP

BY AMY HELEN JOHNSON

HANDHELD devices are more limited than desktop computers in several important ways. Their screens are small — perhaps a few inches square or able to display only a few lines of text — and they're often monochrome instead of color. Their input capabilities are limited to a few buttons or numbers, or entering data takes extra time, as happens with a personal digital assistant's (PDA) handwriting-recognition capabilities. They have less processing power and memory to work with, and their wireless network connections have less bandwidth and are slower than those of computers hard-wired to fast LANs.

The Wireless Application Protocol (WAP) was designed to make it easier to create networked applications for handheld devices despite those drawbacks. WAP is a standardization effort by the Wireless Application Protocol Forum Ltd., an industry association comprising more than 200 vendors of wireless devices, services and tools. The goal of the WAP Forum is to provide a set of specifications that allow developers to write Internet-enabled applications that run on small form-factor, wireless devices. Typically, these devices are smart phones, pagers and PDAs.

The Problems With Handhelds

A handheld's constraints mean that it's usually impossible to directly port a desktop application to a wireless handheld device. For the same reasons, it's difficult to directly access most Web sites with a handheld device. Web applications are traditionally designed based on the assumption that visitors will have a desktop computer with a large screen and a mouse. A smart phone can't display a large color graphic and doesn't have point-and-click navigation capabilities. Programmers need to rewrite applications, taking

DEFINITION

The Wireless Application Protocol (WAP) is a set of specifications, developed by the WAP Forum, that lets developers using Wireless Markup Language (WML) build networked applications designed for handheld wireless devices. WAP was designed to work within the constraints of these devices: a limited memory and CPU size; small, monochrome screens; low bandwidth; and erratic connections. WAP is a de facto standard, with support from more than 200 vendors.

vanced radio data information service network) and the Mobitex RAM mobile data network. In order to create a common programming environment that would let a developer write one application that runs on multiple devices and networks, the WAP Specification Suite was born.

Think of it as the IBM PC of the mobile world, says Carl Zetie, an analyst at Giga Information Group Inc. in Santa Clara, Calif. "It's a single spec that everyone can write to. Instead of having tiny little islands of mobile information, any user with any handset can access information."

The WAP Forum isn't a standards body, but it does work with international standards organizations and offers its specifications for official recognition.

What makes WAP work as a de facto standard is that the major players in the wireless market all support the specification.

Jill House, an analyst at Framingham, Mass.-based International Data Corp. (IDC), lists three of WAP's strong points: "It's got industrywide support, it's nonproprietary and it's well-suited to the devices it's being ported to."

WAP is important, House says, because more and more information is going out over the wireless network. Recent IDC reports predict that sales of smart phones — just one type of device that supports WAP — will reach 2.6 million units in the U.S. and 539 million units worldwide in 2003.

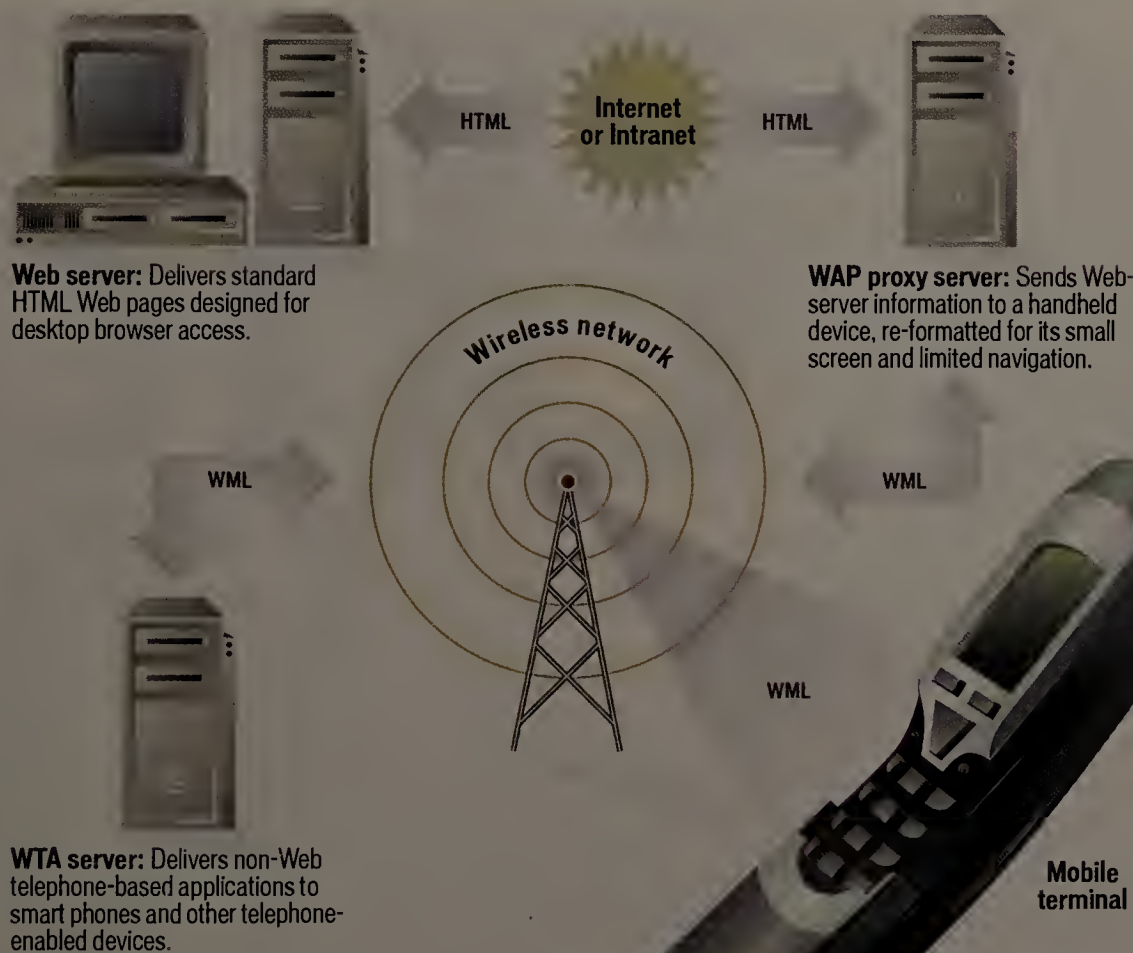
The WAP Forum has a three-stage, public-comment process for including wireless standards specifications in its WAP Specification Suite, now at Version 1.1. ▀

Johnson is a technology and business writer in Seattle.

MOREONLINE

For more on the Wireless Application Protocol, visit our Web site. www.computerworld.com/more

WAP Infrastructure Overview



Web server: Delivers standard HTML Web pages designed for desktop browser access.

WAP proxy server: Sends Web-server information to a handheld device, re-formatted for its small screen and limited navigation.

WTA server: Delivers non-Web telephone-based applications to smart phones and other telephone-enabled devices.

into account the limitations of these devices, and design Web sites so that handheld users can access them.

But the handheld device market consists of many different devices running on competing operating systems: 3Com Corp.'s Palm OS, Psion PLC's EPOC operating system, Microsoft Corp.'s Windows CE, Motorola Corp.'s FlexOS,

Microware Systems Corp.'s OS-9 and Sun Microsystems Inc.'s Java, for example. Handheld applications also need to run over a variety of wireless network architectures, such as Cellular Digital Packet Data (CDPD), Code Division Multiple Access (CDMA), Global System for Mobile

(GSM), Personal Digital Cellular (PDC), Personal Handyphone System (PHS), time division multiple access (TDMA), Flex (Motorola's one-way paging protocol), Re-Flex (Motorola's two-way paging protocol), Integrated Digital Enhanced Network (iDEN), Tetra, Digital Enhanced Cordless Telecommunications (DECT), DataTAC (an ad-

THERE ARE ABOUT 11 MILLION telecommuters in the U.S. today. (It only *feels* like every single one of them is screaming at your help desk from an airport pay phone right this minute.) That 11 million represents 6% of the workforce — and the percentage will double by 2005, according to a study by the Walnut Creek, Calif.-based Institute for the Study of Distributed Work. You're not surprised by that, and you know why: The Boomtown, USA, economy demands corporate creativity in attracting and retaining top workers.

These top workers and their bosses are pushing hard for more bandwidth and better reliability. You, meanwhile, need strong security — if only to get a good night's sleep. A consistent infrastructure would be nice, too, so you wouldn't have to decode a wacky new configuration every time somebody in the field had a problem.

The market is awash with products that promise to help you speed up, secure and manage your remote systems. Let's look at the options.

Breaking the 56K Barrier at Home

An old auto-racing saying: "Speed costs money. How fast you wanna go?"

Cable modems and various flavors of Digital Subscriber Line (DSL) technology are making modest inroads in the fat-pipes department. A study by International Data Corp. (IDC) in Framingham, Mass., projects that 7.3 million cable modems will be up and running by 2001. And 3.1 million DSL installations are expected by that year, according to IDC.

But cheap, reliable high-speed access for everybody, everywhere? Don't hold your breath. "Say you want to provide ISDN to 50 telecommuters," says Gil Gordon, who runs Gil Gordon Associates and was longtime publisher (until May) of "Telecommuting Review," a Monmouth Junction, N.J.-based newsletter. "It always seems like, say, 35 can get it right away and 10 can eventually get it." And the other five? "Never."

And the 14-year-old Integrated Services Digital Network (ISDN) standard is the granddaddy of the fat-pipes movement. "You still hear horror stories" about households trying to get ISDN installed, says Gordon, adding that he's dubious about the spread of whelps like cable modems and DSL.

Here's a quick review:

Analog modems: They're cheap, they're everywhere, they're reasonably reliable (or at least users have learned to work around their foibles) — and, at 56K bit/sec. with the wind at their back, they seem bloody slow to today's users.

ISDN ups the ante to between 128K and 1.5M bit/sec., but faster DSL and cable modems are closing the price gap — and are cheaper in many cases.

Cable modems are asynchronous; data flows downstream (host to user) somewhere between 1.5M and 35M bit/sec., but upstream (user to host) rates can drop to as slow as modem speed on some types. Costs are often lower than for DSL, but security can be a problem, because multiple homes share a single network node.

Although cable modems have a 10-to-1 installed base lead, IDC sees DSL closing the gap in the next several years. Despite its late start and often more expensive rates, DSL is gaining momentum, especially in cases where telecommuters and remote workers are in a predictable, contained area.

The most common versions of DSL — the flavors that use existing copper, rather than fiber-optic,

wiring — are also asynchronous. Data can flow downstream at 8M bit/sec., but upstream rates are slower, generally 386K bit/sec. or less. The rate your user receives is dependent on how close he is to the phone switch (farther away means slower speeds) and how much you're willing to pay.

Plymouth Rock Assurance Corp., an auto insurance carrier in Plymouth, Mass., is seeking to differentiate itself and raise its profile by branding itself as the "agency company of the future," says Rich Wilkins, the company's vice president of technology and CIO. Part of this branding involves moving from a proprietary frame-relay network to a DSL connection with Plymouth Rock's 140 independent agents, who are scattered throughout Massachusetts.

Plymouth Rock is going with Harvardnet, a Boston-based Internet service provider, to hook up the agents. The company chose a local provider because an earlier pilot project with a national West Coast-based company didn't work out because of "West Coast communications problems," Wilkins says. This preference for a local DSL provider comes up a lot — and raises questions about the viability of a truly national DSL program for large national corporations.

Plymouth Rock's pilot program has connected

about 20 agents so far. Two of those are too far from a central telephone switching office for a direct DSL connection (and will remain on a frame-relay network that'll be linked to the DSL network), which brings to mind Gordon's contention that you can never get fat pipes for everybody.

Those who do support telecommuters blessed with broadband tend to like it. "Broadband is actually easier to support than dial-up," says Scott Cebula, executive director of information services at MemorialCare in Fountain Valley, Calif. Many of the health care company's telecommuters enjoy access to cable modems, "because much of the support burden reverts back to the [cable modem] provider," he says.

The best advice is to create a telecommuting support strategy that can handle anything from the humblest dial-up modem to the broadest broadband.

Virtual Private Networks

Virtual private networks (VPN) encrypt and encapsulate data in IP packets, then send those packets over the Internet. They're an increasingly popular way to hook up remote workers.

Tom Armading, network engineer at the University of Rochester in New York, has a variety of remote

EXTEND YOUR REACH

Telecommuting is no longer just an option for most companies, but its impact on IT depends on making the right choices early on

By Steve Ulfelder

On average,

SOURCE: COMPUTERWORLD SURVEY OF 124 IT MANAGERS

13% of full-time employees telecommute

users to worry about: off-campus students and about 700 telecommuters (as well as about a dozen new requests for telecommuting privileges each week). For security, Armading decided to build his own VPN. Build vs. buy is a pressing question with VPNs; some businesses outsource the service to avoid headaches. But "we decided the [Internet service providers' offerings] were too unstable," Armading says. "We decided to do it in-house."

The university, which has almost 8,000 employees, chose a VPN Concentrator from Franklin, Mass.-based Altiga Networks Inc. Why? "It worked, bingo," says Armading with a shrug. Few other vendors whose wares the university tested could make that claim. "It was software and hardware in a box, including decryption engines," he says.

40% of these telecommuters do so as part of their regular 40-hour workweek

Plymouth Rock also uses Altiga VPN Concentrators at about 100 agencies. Client PCs are loaded with a small Altiga VPN IPSec agent that encrypts transmissions.

But not every business wants to build its own VPN. MemorialCare recently set up telecommuting for about 100 physicians. Because the doctors need access to sensitive patient information, "security was vital," Cebula says. "We considered building our own VPN," he says. But MemorialCare decided to go the third-party route and chose Pilot Networks as its supplier. Pilot is also MemorialCare's Internet service provider and has set up a VPN that works in the access hodgepodge that is Southern California (an early test bed for cable modems, the area has an unusually high concentration of those devices).

58% of these telecommuters do so as an "extension" of their regular workday

That Secure Feeling

The two most common ways to provide security on a VPN are tunneling and encryption. In a tunnel, a private point-to-point connection is set up. Encryption scrambles data sent between two endpoints so that even if a snoop sees the information, he can't figure out what it says. Sometimes, tunneling and encryption are used together.

When shopping for VPN tools or a provider, there's a bit of alphabet soup to swallow:

Point-to-Point Tunneling Protocol (PPTP), developed by a forum made up of vendors including Microsoft Corp., is shipped with Windows NT. It's everywhere.

The Layer Two Tunneling Protocol (L2TP) is a pro-

Continued on page 74



"SECURITY WAS VITAL," so MemorialCare called on its Internet service provider, Pilot Networks, to build a VPN to support telecommuting for about 100 physicians, says Scott Cebula, executive director of information services



**Does the fact that technology keeps improving fascinate you?
Or frustrate you?**

It seems every three months there's a new "killer app." The media heralds it. Startups sell it. And you lie awake at night wondering if you should buy it.

Case in point. A well-known insurance company was hearing a lot of good things about Voice over IP technology. About how it could help their branch

offices communicate with their home office for a fraction of the cost.

Naturally, the insurance company wanted someone with experience. Someone like MCI WorldCom.SM After all, they not only knew we were one of the world's largest Internet providers. They knew we had a wholly owned, seamless global network.* One which gave us the freedom to offer them almost

any kind of data service known to man—including the latest killer application.

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we went in and assessed the situation, however. We saw they used IP for e-mail. But kept the lion's share of their mission-critical data on Frame Relay. An important distinction. Because that meant they

could use the spare bandwidth on their Frame Relay to carry voice. Maximizing their previous investment. Minimizing their new one.

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89%

of telecommuters dial in using modems. This number is expected to drop to 77% over the next 12 months

SOURCE: COMPUTERWORLD SURVEY OF 124 IT MANAGERS

Continued from page 71

protocol under consideration by the Internet Engineering Task Force (IETF) for tunneling Point-to-Point Protocol, or PPP. L2TP is essentially an evolution of PPTP, whose security has been called a "total disaster" by security consultants.

The IETF developed IPsec for obtaining secure communications over the public IP infrastructure. It includes protocols for data formats, secure key exchange and encryption. IPsec builds these security measures into the network layer.

Because it's caught on as a de facto standard, IPsec also ensures compatibility; IPsec-compliant VPNs can talk to IPsec-compliant security tools.

Best advice: Seek flexibility. Altiga handles PPTP, IPsec and L2TP. That was "a big selling point," Armading says. He sees IPsec in particular gaining popularity in the future.

Drawing the Line

The growth of telecommuting is prompting many IT shops to exert more influence over just what software gets installed on all those far-flung machines. After all, it's one thing when some schmo in the office has a copy of Mech Warrior 3 interfering with his work-related functions: The problem is easily found, the user gently upbraided. Move the problem 2,000 miles away — and add a user who may have forgotten

about his game or is loath to admit its existence to the help desk — and you've got trouble.

As a result, "companies are standardizing on one or two models of PCs and maybe one to three software suites, and saying, 'That's it: We'll support these configurations and nothing else,'" says Gordon.

That's the case at Prudential Insurance Company of America. Since the beginning of 1998, the Newark, N.J.-based insurer has spent close to \$100 million issuing laptop computers to 11,000 insurance agents. On this scale, a "controlled environment" was needed, according to Bob Piccarillo, vice president of field infrastructure.

"Agents are not allowed to install anything other than authorized software," Piccarillo says. Anything else might "conflict with our [authorized] software" or even "cause a security breach," says Piccarillo.

If IT nabbed an agent loading verboten applications, Prudential would send out a warning letter with a reminder that "if they don't remove it, we will take back the laptop," Piccarillo says, hastening to add that "we haven't had to do that yet."

Managing Apps

In response to the rise in telecommuting, many software distribution and management tools have been souped up with remote users in mind. Such tricks as data compression capabilities and incremental updating aim to make the best of low-speed connections. Dallas-based Sterling Commerce Inc.'s Connect:Remote, Cupertino, Calif.-based Symantec Corp.'s pcAnywhere and a host of competitors have all received a telecommuting facelift, as have such giants as Microsoft's Systems Management Server and products from Austin, Texas-based Tivoli Systems Inc. and Islandia, N.Y.-based Computer Associates International Inc.

How do you keep tabs on 11,000 notebooks' worth of software? Prudential chose Novadigm Inc.'s Radia, which Piccarillo calls "a programmer's best friend." Prudential also uses Mahwah, N.J.-based Novadigm to update its authorized applications and to fix bugs. "Normally, with CDs, it'd take weeks and cost \$50,000 [to] \$60,000" to do a major quarterly update, Piccarillo says. "With Novadigm, it takes three days." He says Prudential "zapped" more than 60 bug fixes in the past nine months.

John Girard, an analyst at Stamford, Conn.-based Gartner Group Inc., recommends such configuration management tools for telecommuting-heavy organizations. In addition to Novadigm, Tioga Systems Inc.'s Healing System and Full Armor Corp.'s (formerly Micah Development) Full Armor are in wide use. When something goes wrong with a notebook, some of these tools tell it to "simply roll back to the last time it worked properly," Girard says.

He says he applauds this approach because "PCs are so unstable that the thought of diagnosing a problem on one remotely is obsolete."

The Human Side

Conventional wisdom says holders of some job titles make good telecommuting candidates, while others don't. Documentation specialists, for instance, are obvious candidates for a notebook computer — but customer service agents who need access to several real-time databases need to be in the office. But this may be worth a rethink.

"Telecommuting today is not a full-time proposition," Gordon says. "Most telecommuters are out of the office one to three days a week. So the question is, 'Which jobs have one to three days' worth of telecommuting in them?'"

Some jobs that, at first glance, seem to be impractical for telecommuting are not, Gordon says. The key is, "how integral is use of that [software] tool to the



ANDRÉ SOURBOUON

“

Agents are not allowed to install anything other than authorized software.

BOB PICCARILLO,
PRUDENTIAL INSURANCE

job? If you need that [enterprise resource planning] app all the time, sure, you need to be in the office," he says. But most telecommuters do a good job of arranging tasks to maximize productivity at home and in the office, he adds.

Users and analysts agree that telecommuting makes training more important than ever — for end users and IT support staff alike. "You've got to bring the help desk up to speed," Gordon says. "Nobody's happy with support to begin with, and it's tougher when it's remote." ▀

Survey: Telecommuting Accelerates

Computerworld surveyed 124 IT managers who support telecommuters at companies with 500 or more employees and asked them to describe how their telecommuting support practices will evolve over the next 12 months. Almost all said the move to at least part-time telecommuting is accelerating rapidly.

Despite dramatic gains for telecommuting in the past two years, however, the number of employees actually telecommuting at any single company remains small.

Nearly three-fourths of our respondents said telecommuting options were presently used by only 10% or less of total eligible employees. Not surprisingly, information

technology departments have the highest percentage — about 41% — of telecommuters, followed by financial, customer service, sales and marketing departments.

Most respondents — 81% — said their telecommuters spend at least half their time in the office, where they can bring at least some equipment in for support.

Only about 11% could be considered full-time telecommuters. But that number is changing. Only one manager said he expected the number of full-time telecommuting employees in his company to actually decrease; 24% anticipated the number would stay about the same over the next year. But 75% of our re-

spondents expected the number of full-time telecommuting employees to increase sharply in the next 12 months, by an average of 34%.

Interestingly, only 59% of the companies we surveyed supply telecommuters with all the equipment they need to work remotely; 41% said the employee supplied at least part of those tools. Most companies support their own equipment, of course, but 73% said their help desks also troubleshoot problems with employee-owned hardware and software, and 41% will also install company-owned tools on employees' equipment. Less than one-third, however, maintain, repair or upgrade the employee's equipment if there's a serious problem.

Seventeen percent cited technology problems such as incomplete re-

mote access solutions or lack of proper equipment as a major obstacle in successful telecommuting support. Another 15% said the high cost of training and supporting remote users placed limits on the number of employees they could adequately handle. Almost one-quarter of our respondents said they'd denied an employee permission to work from home because one or more critical applications performed poorly in a remote environment.

Nearly half of the IT managers surveyed also told us that the most-needed applications — business processing tools such as human resources, accounting, database and transaction processing systems — are also the most difficult to support. End-user applications, such as word processing systems, gave little trou-

ble. Communications and networking devices turned out to be the culprits in most hardware failures, according to those surveyed, although PCs themselves ran a close second.

But technology was a relatively minor issue for most of the IT managers surveyed.

Business processes and management issues remain the biggest obstacles to expanding the telecommuting programs at their corporations. Most respondents said the chief hindrance was the fact that key employees still need to be physically present in the office to do their work. And some managers remain reluctant to leave employees on their own; 27% of the respondents said management was preventing expansion of their telecommuting programs.

— Cynthia Morgan



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Mbone Opens Internet's Ears

BY LESLIE GOFF

THE MILLIONS of Web users around the globe who logged on for the NetAid concert on Oct. 9, and the concert organizers who raised \$27 billion, owe a debt of gratitude to a meeting of the Internet Engineering Task Force (IETF) in March 1992.

It was there that Steve Deering, Stephen Casner and a handful of others demonstrated for the first time the Mbone (Multicasting Backbone), a virtual network overlaying the Internet infrastructure as a transport mechanism for IP multicasting.

Deering, a researcher at Xerox Corp. PARC in Palo Alto, Calif., developed IP multicasting for the transmission of audio and video packets over the Internet. Whereas information sent over the Internet is typically divided into multiple packets that travel independently to the same destination, in IP multicasting a single packet can have multiple destinations. It isn't split up until the last possible moment when it's finally divided to reach its multiple recipients. The bandwidth efficiency of IP multicasting enables quality transmission of streaming audio and video on the Web.

In 1991, successful IP multicasting tests were conducted over DartNet (DARPA Testbed Network), a government-sponsored, cross-country network that supported multimedia applications research. Casner, then a project manager at the University of Southern California's Information Sciences Institute, and Deering decided to try it over the broader Internet at the IETF meeting.



NETAID connected to the Mbone during the Oct. 9 event, which featured Wyclef Jean, Bono, Quincy Jones and Sean "Puffy" Combs

"It was a wild and crazy idea," says Casner, now a senior software engineer in the Video Internet Services unit at Cisco Systems Inc. in San Jose.

Casner set up the demonstration, rigging up special microphones and creating tunnels from the IETF meeting to remote locations.

"It worked, with varying degrees of success in different places," Casner says. The highlight of the demo came at the closing plenary session, when Van Jacobsen, an engineer at the University of California at Berkeley who was attending the meeting remotely, spoke back to the participants over the Mbone. "It was live, with no more than a second's delay," Casner recalls.

As chair of the IETF's Audio/Video Transport working group, Casner became the

head honcho of the Mbone effort, coordinating the virtual topology of the tunnels to match the physical topology of the Internet.

The demonstrations spurred tremendous interest in sending audio and video over the Internet. They also were arguably the genesis of the subsequent development of audio and video players like Microsoft Corp.'s Windows Media Player.

"We are in midst of transition," Casner says. "It was always intended that the Mbone should eventually fade away. The idea of a virtual network overlaying the actual Internet was just an expedient to the days when multicasting would be a standard part of all routers."

And while Multicast Routing Protocols have become a standard feature in most routers, the protocols

are implemented differently in different vendors' products, creating interoperability issues when audio and video packets are sent across different domains, Casner says.

So, IP multicasting is still best suited to applications within a single domain or enterprise, such as internal corporate videoconferencing. The intradomain protocol implementations are more stable.

Native IP multicasting across the Internet lies a few years off, Casner says. But because audio and video over the Internet is such a compelling application, Web-based media players have proliferated, accommodating Webcasting by means of parallel unicasting. That is, the same audio or video stream is sent out x number of times to x number of users, which eats up a lot of bandwidth.

That's how most NetAid participants received their streaming audio and video, with a higher degree of success than in previous large-scale Webcasts. NetAid set a record with 2,494,135 total Web streams sent out in a single day and a 99.33% success rate for Web stream connections, vs. an average 40% connection rate in past Webcasts, according to Cisco.

University students and researchers who connected to Internet2, a collaborative testbed for advanced Internet technology research, received streaming audio and video via IP multicasting over the Mbone, experiencing less than 2% packet loss during the show, Cisco reports.

"The presence of the Mbone was a significant driver for getting multicasting implemented in commercial routers," Casner says. "I don't know if the 1992 demos will have a legacy beyond the technical community, but they were the impetus for router vendors to go down that path." ▸

Goff is a frequent contributor to Computerworld. Contact her at lgoff@ix.netcom.com.

Technology Happenings

■ **Brendan Kehoe** publishes the guide *Zen and the Art of the Internet*.

■ Librarian **Jean Armour Polly** coins the phrase "surfing the Internet," when she publishes an article by that title.

■ **Bill Porter** helps launch **ETrade Securities Inc.**, which offers the ability to manage investments online in real time.

■ **Rear Adm. Grace Murray Hopper**, one of the first computer programmers and inventor of the first compiler, dies in Arlington, Va.

■ **Jeff Hawkins** and **Donna Dubinsky** found **Palm Computing** to develop handheld personal digital assistants (PDAs). Palm's first product, the *Zoomer*, is a flop.

■ The **University of Nevada** releases **Veronica**, a gopher search tool.

■ **Creative Labs Inc.** introduces the **Sound Blaster 16 with Advanced Signal Processor**, a 16-bit stereo PC sound card.

■ **Sun Microsystems Inc.** introduces the **SPARCstation 10 system**, offering multiprocessing capabilities.

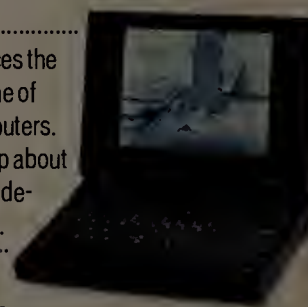
■ **Microsoft Corp.** ships **Microsoft Access Database for Windows** based on the beta version of Windows NT and Windows 3.1.

■ **IBM** introduces the **ThinkPad**, a line of notebook computers. The line picks up about 300 awards for design and quality.

■ **MIPS Computer Systems Inc.** and **Silicon Graphics Inc.** announce plans to merge.

■ **U.S. District Court Judge Vaughn Walker** rules that most of the elements in Apple Computer Inc.'s look-and-feel lawsuit against Microsoft and Hewlett-Packard Co. were covered by Apple's agreement with Microsoft or weren't copyrightable.

■ **The Internet Society** is chartered.



Other Notables

■ **Johnny Carson** steps down as host of *The Tonight Show*.

■ **DC Comics' Superman** dies.

■ **Best Picture: *Unforgiven***

■ Flashback is produced with the assistance of The Computer Museum History Center in Mountain View, Calif.

Four police officers are acquitted of beating Rodney King in Los Angeles; violence erupts in L.A.

The officers acquitted in the King case are indicted on federal civil rights charges.

The Prince and Princess of Wales agree to separate.

JANUARY

FEBRUARY

MARCH

APRIL

MAY

JUNE

JULY

AUGUST

SEPTEMBER

OCTOBER

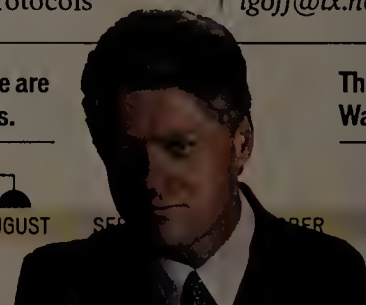
NOVEMBER

DECEMBER

President Bush and Russian President Yeltsin proclaim an end to the Cold War.

The Supreme Court reaffirms the right to abortion but allows for state restrictions.

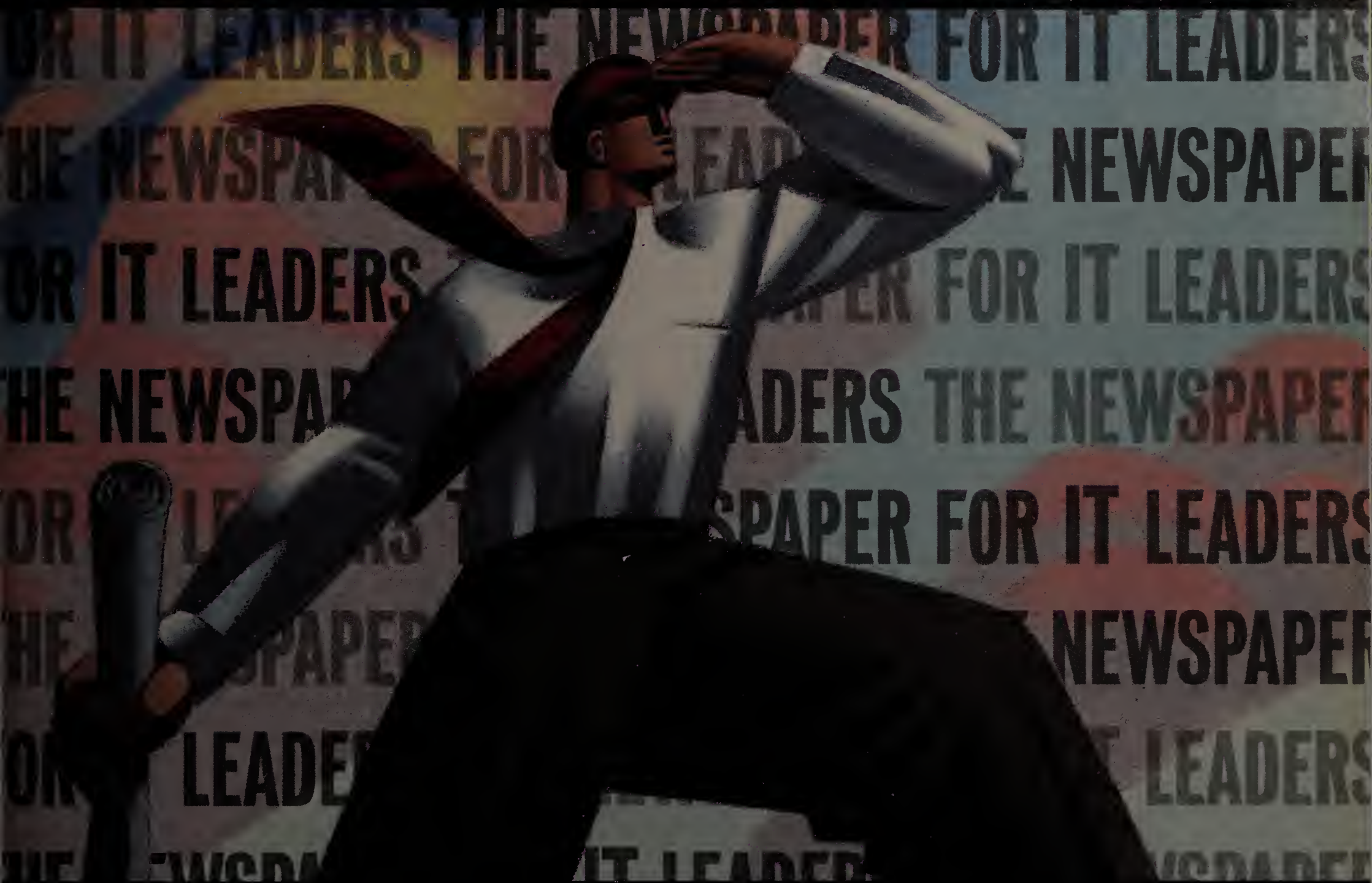
Bill Clinton is elected president and Al Gore vice president. Democrats retain control of Congress.







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Programmers for A New Century

The new year holds promise for reactivated projects, changing business strategies and lots of new skill demands
By Melanie Menagh

NOW THAT Y2K is (hopefully) taken care of, information technology projects that were on hold are fast coming to the fore. Areas like e-commerce and converging technologies are going to be huge over the next few years, and they will require 10 times more brains and bodies than anyone banked on, some experts predict.

Given this momentum, where should programmers put their money? What skills will they need to succeed in the near future? E-commerce is expanding exponentially. Beyond buying that new Ford or frock online, the real boom is going to be in online business-to-business transactions.

"This is key to the big transition from [electronic data interchange] to [Extensible Markup Language] (XML)," says David Grant, chief technology officer at Irvine, Calif.-based Autobyte.com, a compa-

ny that sells cars on the Internet. "This will ease the translation of data between dissimilar environments and also the presentation of published data through XML islands within a browser."

These developments are all going to make database skills "incredibly important," says Bruce Sink, chief technology officer at First Union Corp., a banking organization in Charlotte, N.C. "On the e-commerce side, you'll be using databases to do things like check demographics, help pin-

point markets in ways that you couldn't before. The data modeling systems will help businesses to understand customers better because they track behavior, which is a much better indicator than answers in focus groups."

Convergence Calling

Convergence of technologies is another hot spot. For example, "voice mail and e-mail will be converging into a single messaging system," says Sink. "You're going to need Internet skills, Java, any of the other fourth- and fifth-generation languages. The scale is so much bigger, you're going to need to find the common denominator, so you're going to have to bring programming skills from different disciplines to the problem and integrate them."

Programmers, aside from being Java- and Component Object Model-savvy, are going to need to have a better overview of the entire process. "Programmers need to know how Web servers work, how requests get processed," says Jeff Scherb, senior vice president and chief technology officer at Tribune Co. in Chicago and president of Tribune Interactive. "Not just from the latest hot-shot techie point of view, but even Cobol people: They will have to create back-end code that integrates with legacy order systems."

Nifty With Networking

The Internet's ubiquity calls for top programmers. Mark Kortekaas, vice president of technology at Sony Online Entertainment in New York, says, "It's not enough just to know Java. Programmers are going to know the difference between TCP and [User Datagram Protocol]. Our programmers need to understand networks; it's different from writing stand-alone applications because of the reliance on the network player for a large part of what the application does. We don't

have enough people who have experience on custom server-side application programs and large-scale deployment. But that's true with every industry. It still comes down to finding programmers who can do custom back-end work, because that's where all the logic is stored. It's the same paradigm whether for Internet or in-house applications."

So what skills do potential employers repeatedly claim they want to see prominently displayed on a résumé? "We've been putting the brakes on [enterprise resource planning] systems because of Y2K," says Scherb. "But those projects are going to pick up again, and we're going to need stuff like PeopleSoft, SAP, Oracle." He says he's also looking for people skilled in Java, Perl or C.

"We need Perl for transaction analysis; we need stuff to address minimum resource utilization. We need programmers who understand algorithms, memory management," Scherb says. He especially wants larger-picture people, he says. "People have got to know what the system will do when it's up and running."

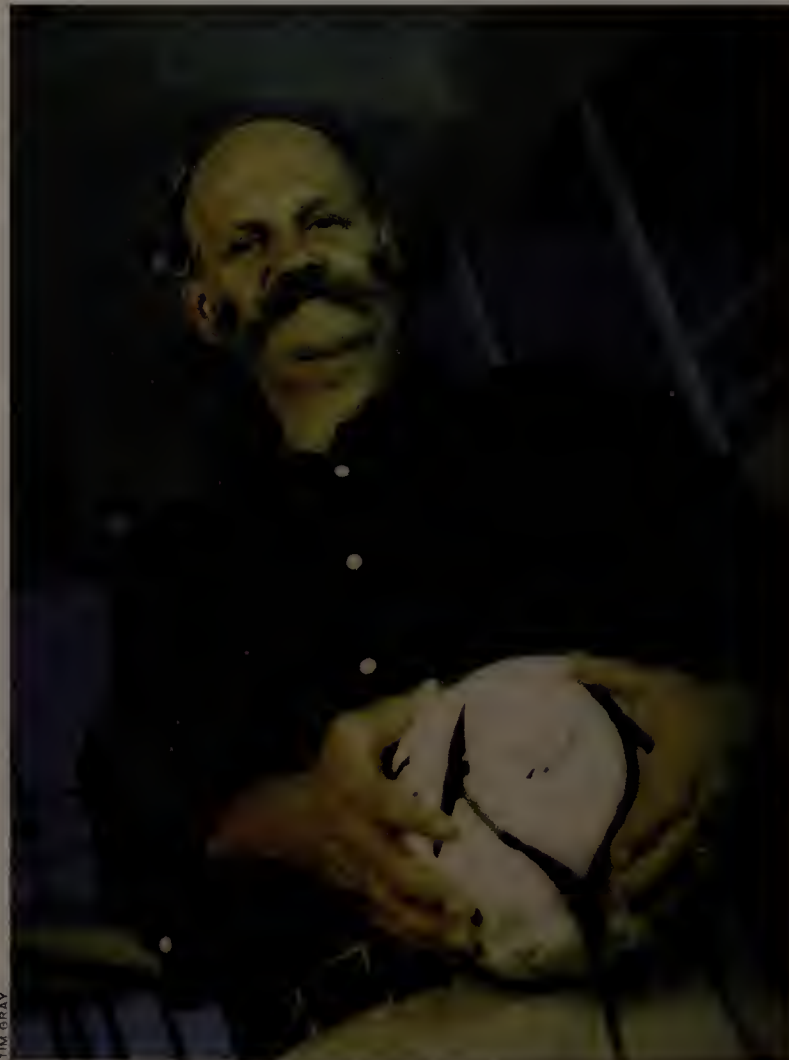
So, just learn everything and you'll be OK. Right? Good luck, says Peter Burrows, chief technology officer at Reebok International Ltd. in Stoughton, Mass. The skills he says he likes are Advanced Business Application Programming development, Access and other Microsoft Corp. products. But Burrows wants more.

Firm About Flexibility


"I'm looking for someone who's flexible, who has an ongoing commitment to changing and rearranging their skills," Burrows says. As for job candidates, he says, "I don't want to see a résumé that looks like alphabet soup, with so many things on it — nobody could be really good at all those things." On the other hand, Burrows says he wants diversification. "I want someone who's adaptable and can strike out in new directions."

Says Kortekaas: "The successful programmers will have to understand the big picture, how all these technologies integrate. That's a unique skill set." ▀

Menagh is a freelance writer in Maple Corner, Vt.



PETER BURROWS, chief technology officer at Reebok International Ltd., doesn't "want to see a résumé that looks like alphabet soup"



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Systems Solutions & Services Consulting Inc. is a global software consulting company providing high quality consulting services to leading Fortune 500 companies to help them build the information systems of tomorrow. We have offices in Atlanta, Minneapolis, San Ramon, South Africa, Japan, UK and a development center in Asia. Our professionals are delivering applications and enterprise management services, Year 2000 compliance programs, turnkey project management and consulting services.

Due to our rapid growth, we have immediate, full-time opportunities in the following areas:

- **E-Commerce practice**
- **Solution Architect** - Leader having hands on project management of Internet and web-based commerce related development efforts. Knowledge of Net.Commerce or any other e-commerce web-based packages is highly desirable.
- **Internet programmers** - for advanced web solutions with strong skills in Visual C++, COM, ActiveX, ASP, JavaScript, Socket programming, Java, PERL, HTML.

The above positions are for LA, Atlanta, Chicago, Boston, New York, Dallas, Miami.

The positions carry competitive salaries and benefits. Please e-mail your resumes to: jones@s3c.com; Fax: 630-548-4500; Phone: 630-548-4800 or mail resumes to: Systems Solutions & Services Consulting Inc., attn: Recruiting Department, 1755 park Street, Suite 30S, Naperville, IL 60563. www.s3c.com. EOE.


Contractors

For more than 25 years, CPL WorldGroup has supported customers across the US with top talent. Are you ready to join us? We need contractors (Programmer Analysts to Systems Analysts) with the following skills

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Interested? FAX or e-mail your resume to

CPL WorldGroup, Inc. 1990 N California Blvd. Suite 950. Walnut Creek CA 94596. FAX 925/472 4904.
contract@cplworldgroup.com



Multiple positions for IT professionals with NJ based IT firm as following:

Software Engineers: Masters in CS or Engg., with 2 years exp., as Soft. Engr or as Programmer Analyst or a Bachelors in C.S., or Engg., with 5 years exp., as Soft Engr or as Programmer Analyst.

Programmer Analyst: Bachelors in Engg. or Bachelors any field with 1 year trng in Software Development, and 1 year experience on the job or as Systems Analyst.

Various skills combinations required: Sybase, Powerbuilder, MS-SQL, Oracle, Visual C++, Windows NT, etc. Apply with two copies of resume to H.R. Department, Jean Martin, Inc 7000 Blvd East, Guttenberg, NJ 07093.

Multiple positions for IT professionals with NJ based IT firm as following:

Software Engineers: Masters in CS or Engg., with 2 years exp., as Soft. Engr or as Programmer Analyst or a Bachelors in C.S., or Engg., with 5 years exp., as Soft Engr or as Programmer Analyst.

Programmer Analyst: Bachelors in Engg. or Bachelors any field with 1 year trng in Software Development, and 1 year experience on the job or as Systems Analyst.

Various skills combinations required: Sybase, Powerbuilder, MS-SQL, Oracle, Visual C++, Windows NT, Java, A.S.P. etc. Apply with two copies of resume to H.R. Department, Scosys, Inc 200 Middlesex Turnpike #204, Iselin, NJ 08830.

Multiple Openings for Systems Analysts & Software Engineer for PA & NJ locations. Required skills IBM PC, AS/400, OS/400, windows 95, DVS, COBOL/400 CL, RPG/400, DBA/400, OQUERY/400, Dbase III plus Java Clipper, Foxbase, C, C++, Java, Javabeans, SOL, PL/SOL, Oracle, Sun Solaris, Visual Basic, Oracle Discover 2000, Unix, C, Shell, T-SOL, APT, RPT, HP-UX, AIX 4.1. Sybase Db, Sybase Developer, Sybase Replication Server, T-SOL Oracle DBA, applications must have a BS or equivalent in computer sci. + 2+ years of exp. In combination of the above stated skills requested. Send resume to Dynamic Systems, 650 North Canon Ave, Landsdale, PA 19446 or to 260 Kempsey Drive, North Brunswick, NJ 08902

PROGRAMMER/ANALYST to design, develop, test, implement and maintain revenue management system modules such as GUI, Forecaster, Optimizer and SQL in a client server, environment using C, C++, Visual C++, Visual Basic, SOL Windows and Informix on Windows and UNIX platforms; provide specialized computer consultancy services to analyze, design, develop and implement application software requirements using object oriented design and programming with C, C++, Sybase, Oracle and SOLBase. Require: B.S. in Computer Science/Computer Engineering and two years experience in the job offered or as Software Engineer. Salary: \$59,000 per year, 8 am to 5 pm, M-F. Mail resume to: R. Lynn Howard, Manager, Human Resources, Talus Solutions, Inc., 4751 Best Road, Suite 300, Atlanta, GA 30337.

System Administrator sought by Computer Services Co. in Red Bank, NJ for client locs throughout US. Must have Masters in Comp Sc. Comp Engg & 6 mos computer exp. Respond to: HR Dept, Configuration Management, Inc. 140 Broad St, Red Bank, NJ 07701.

Applications Developer. (2 positions) Design, analyze, develop and maintain a network of computer systems and software applications for fax services, which provide enhanced optimization and improve reliability, stability and level of customer service for financial and messaging services operation. Applications development involves main data modeling, i.e. translation of metaCASE models into UML data models for object oriented tools.

Minimum requirements: MS in computer science or information systems. Knowledge of C++ and object oriented methodologies. No experience necessary. Please send resumes to: Hiring Manager, Western Union Commercial Services, 5775 E Glenridge Drive Suite 150, Atlanta, GA 30328

SOFTWARE ENGINEER to provide on site consultancy for full software lifecycle design and development including analysis, design, development, testing, implementation, documentation, user support for client/server applications; training specifically pertaining to conversion from conventional computing to distributed client/server environment using object-oriented methods; program solutions in C/C++ on UNIX/Windows using object-orientation; use, source code control systems and program GUI with X-Windows/Motif Require: Masters in Computer Science (or equivalent) with two years experience in the job offered or as Computer Consultant. Salary: \$63,000 per year, 8 am to 5 pm, M-F. Mail resume to: Sanjay Gupta, President, Wavesoft, Inc., 4680 Weatherlane Drive, Alpharetta, GA 30202.

SOFTWARE ENGINEER to provide on-site software consulting in analysis, design and development of business applications for manufacturing, distribution and retail industries using CASE tools (Progen) on IBM AS/400; provide customization and implementation of ERP packages including Shop Floor tracking systems (MESA) and Merchandising Management Systems (JDA) using RPG, RPGLE, COBOL, C and SQL, and interact with user groups to determine system requirements. Require: B.S. (or equivalent) in Electrical Engineering or Computer Science and three years experience on AS/400. 40% travel to client sites within the United States required. Salary: \$60,000 per year, 40 hours/week, 8 am to 5 pm, M-F. Mail resume to: Vice President, Frontline Consulting Services, Inc., 8701 Mallard Creek Road, Charlotte, NC 28262.

Software Engineer sought by Automotive Systems Co. in Kokomo, IN. To research, design & develop embedded systems s/ware in conjunction w/hardware product development for automotive engine control and analyze s/ware specs in English & Japanese. Bachelors in Comp Sci or related req'd. Respond to: HR Dept, Attn: Shannon Miller, Delphi Delco Electronics Systems, 2151 East Lincoln Rd, Kokomo, IN 46904-9005.

Database Design Analysts needed to analyze/design database systems & Internet appl. using Oracle, JAVA & HTML. Apply to HR, Global Consultants, 601 Jefferson Rd, Parsippany, NJ 07054.

Senior Systems Analyst needed F/T by Fort Lee Co developing & improving AS/400 comp s/ware systems. Must have Bach deg & 4 yrs comp exp. Respond to: HR Dept., Pallas Corporation, 530 Main St, Ste 102, Fort Lee, NJ 07024.

Chief Computer Programmer sought by Investment S/ware Producer in Boston, MA. Must have BS in Comp Sci or equiv & 2 yrs computer experience. Respond by resume to: HR Dept, Thomson Financial Services, 22 Pittsburgh Place, Boston, MA 02210.

Programmer Analyst sought by IT Co. in Union, NJ. Must have 3 yrs exp as Oracle Developer bldg systems using ProC, PL/SOL & SOL*Forms in Unix & Windows envrnts and writing stored procedures & triggers using PL/SQL, CGI prgmg using Perl, JavaScript & HTML. Respond to: HR Dept, Patel Consultants Corp., 1525 Morris Ave, Union, NJ 07083.

Network Administrator sought by IT Co. in Union, NJ. Must have BS in Electronics or Comp Sci & 5 yrs exp in system n/work administration working w/IBM & Macintosh & using MS Exchange & Outlook. Respond to: HR Dept, Patel Consultants Corp., 1525 Morris Ave, Union, NJ 07083.

Technical Director for Public Key S/ware sought by Security S/ware Co. in Bedford, MA. Must have BS in Math, CS or related & 3 yrs s/ware experience. Respond to: HR Dept, Security Dynamics Technologies, Inc., 20 Crosby Dr, Bedford, MA 01730.

Systems Engineer wanted by S/ware Products, Tools & Services Co. in North Andover, MA. Must have MS in Statistics, CS or related & 2 yrs exp dvlpg & enhancing legacy systems. Respond to: Personnel, Sofnet Technology, Inc., 47 East Water St, North Andover, MA 01845.

Software Engineers: Masters in CS or Engg., with 2 years exp., as Soft. Engr or as Programmer Analyst or a Bachelors in C.S., or Engg., with 5 years exp., as Soft Engr or as a Programmer Analyst.

Various skills combinations required: Sybase, Powerbuilder, MS-SQL, Oracle, Visual C++, Windows NT, etc. Apply with two copies of resume to H.R. Department, XL SOFTEK 14 M, RELEER LANE, SOMERSET, NJ 08873.

Newton, MA based Health Care Consultancy seeks Programmer/Analyst. Minimum Bachelors Degree in Computer Science, science, engineering field plus 3 years full life cycle software development experience. Knowledge of Mumps, Visual Basic, web programming techniques and Office development tools required. Health care industry experience essential. Respond to: HR Dept, Hayes Management Consulting, Inc., 1320 Centre St, Newton Center, MA 02459.

Regional Network Support Engineer: Several senior and entry level positions available for qualified candidates possessing a Bachelors or equivalent in computer science or electrical engineering or related field and relevant work experience. Experience with data network architectures (FastEthernet, DOCSIS, FDDI, etc), protocols (TCP/IP, HDLC, etc), POTS, Telephone Network architectures, PBX systems and multiplexing/channelizing techniques required. Must be willing to travel. Fax resume to Adelphia, HR Dept, Colin Presall at (802) 658-5488.

Network Consultant (multiple openings) to install & maintain networks at client sites using Novell NetWare, Windows 95, Windows 3.1x and MS DOS; Reqs. Master's in Comp. Sci., Systems Analysis, Comp. Info. Systems, Computer Technology, Comp. Engg., Electrical or Electronic Engg., Statistics or Mathematics or its equiv in educ & exp. plus 2 yrs exp in the job offered. Will accept a bachelor's degree, or a foreign equiv degree, followed by at least 5 yrs of progressive exp in the specialty, in lieu of the req'd educ & exp.; \$60,550/yr, 40 hrs/wk, 8a-5p. Submit resume or C.V. to The Phila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila., PA 19123, J.O. #6028201

Programmer/Analyst: needed to perform analysis, system design, programming, documentation, training, system implementation, system acceptance, and data design in Client Server environment. Design and develop a web base relational database system. Must have MS. or equivalent in CS, CIS, or CompE. Proficiency in VB, C++, MS SQL, and Java. \$59,000, 40hr/wk, 8:30 a.m.-5:30p.m. plus excellent benefit. Send resume to 2957 Clairmont Road, Suite 300, Atlanta, Georgia 30329 Fax: 404-321-9275. EOE

SOFTWARE ENGINEER - Needed to design, develop and deploy new e-commerce web applications; participate in complete software development life cycle, including analysis, design, code and unit test. Must have MS or equivalent in CS/CIS, or Engineering with at least one year experience in job offered. Must be proficient in C++ on Unix/Windows. \$63,000.00 per year plus benefits program, 40 hrs/wk, 8a.m. to 5p.m. Mail resume to: Attn: Lisa Phillips, Dept. of Human Resources, Harbinger Corporation, 1277 Lenox Park Blvd., Atlanta, GA 300319-5309, Fax: 404-848-2841 or E-Mail: resumes@harbinger.com.

Programmer Analyst: Dsgn, dvlp & implmt application s/ware using Adabas, Natural 2.1,2.2 in reporting/structured modes. Predict, JCL, TSO, ISPF on IBM mainframes. Plan, dvlp & test prgms. Req 2 yrs exp in job off or 2 yrs exp as Prgmr or related pos w/same duties & BS in Engg. or related field. \$60K/yr. EOE. Send resume to Shiva Systems 635 Anderson Cir., #109, Deerfield Beach, FL 33441

TBG, a global provider of software and internet based e-commerce solutions, is seeking talented, motivated IT Professionals. Specializing in:

Network Infrastructure
Software Design & Development
Web Centric Design & Development

View our website: www.bostongroupusa.com
e-mail your resume to: recruiter@bostongroupusa.com



Exsequor is seeking IT professionals with B.Sc. degrees and higher in Computer Science or related field plus 1 year experience developing software using Visual C++ and Component Object Modeling tools and applications. Send resumes to Exsequor, Inc. 416 McCullough Dr., Suite 155, Charlotte, NC 28262, fax it to (704) 717-0408 or email to droux@exsequor.com.

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SAP Consultant (multiple openings) to consult with client to define business need or problem relating to quality management & production planning applications; analyze business processes & document flow, & prepare functional specifications for same; design, develop & customize information structures using SAP (Systems, Applications and Products) module; perform data conversion from existing system to newly defined SAP system; assist in implementation of solutions; & report findings & recommendations to client; Reqs. Master's in Comp. Sci., Systems Analysis, Comp. Info. Systems, Mgmt. Info. Systems, Bus. Admin., Management, Mech. Engg., Indust. Engg., Manuf. Engg., Chemical Engg., Comp. Engg., Electrical or Electronic Engg., Statistics or Mathematics or its equiv in educ & exp. plus 3 yrs exp in the job offered or 3 yrs related exp as Systems Analyst/SAP, Production Executive, Engineer, Trainee Engr. or Assist Engineer-Projects. Will accept a bachelor's degree, or a foreign equiv degree, followed by at least 5 yrs of progressive exp in the specialty, in lieu of the req'd educ & exp.; \$64K, 40 hrs/wk, 8a-5p. Submit resume or C.V. to The Phila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila., PA 19123, J.O. #7056489

SOFTWARE ENGINEER to provide on-site consultancy to analyze, design, develop, test, implement and support business application software for legacy systems using MVS/ESA, JCL, VSAM, DB2, SQL, IMS DB, IMS DC, QMF, SPUFI, BMC, FILEAID, XPEDITER, RACF, PROEDIT, MFS and CICS on operating system MVS/ESA in IBM Mainframe environment (IBM ES 9000); design and develop IBM relational database (DB2); conduct interface of Mainframe databases DB2, IMS with Web applications in client/server and object-oriented environment; and provide ORACLE 7.0/8.0 database administration and ORACLE database tuning by designing and developing applications using SQL, PL/SQL, ORACLE Forms/Reports. Require: M.S. (or equivalent) in Computer Science and two years experience in the job offered or as Programmer/Analyst or any experience providing skills in above duties. 40% travel to client sites within the United States required. Salary: \$62,000 per year, 8:30 am to 5 pm, M-F. Mail resume to: President, YASH Technologies, Inc., 2100 Parklake Drive, NE, Suite F, Atlanta, GA 30345-2167.

SAP PROJECT SERVICES MANAGER. Multiple openings for full-time SAP Project Services Manager. Responsibilities include: manage the design, development, and implementation of SAP software systems and the marketing of SAP consulting services; draft and negotiate proposals for the provision of SAP software services and the development of SAP systems; define and negotiate project costs; manage marketing analysts, systems analysts and other technical support personnel; manage strategic planning and budget allocation; and manage client relations. Must have a Master's degree or foreign equivalent in computer science, engineering or a related field and three (3) years of progressive experience in computer science or engineering or a Bachelor's degree or foreign equivalent and at least five (5) years of progressive experience in computer science or engineering; must be willing to travel to client sites Monday-Friday. Must have proof of legal authority to work in the United States. Salary Range: \$75,000 - \$100,000 per year. If interested, submit resume in duplicate to: Ms. Michelle O'Donnell, Director, Human Resources, Prescient Consulting, Two Concourse Parkway, Suite 275, Atlanta, GA 30328

Systems Engineer; 40 hr/wk; 9-5; \$53,300.00/yr: Design & development of Relational database systems & client/server applications using a variety of languages & applications including Oracle, Structured Query Language, PI/SQL, Access, MS SQL Server, Visual Basic & other client/server development tools; management of large relational database systems including backup & recovery procedures; database tuning; database reorganizing, networking & training; interfacing database systems with manufacturing development software such as WonderWare, Intellution & Factory Link; linking database systems to industrial control equipment such as PLC's (Programmable Logic Controllers); development of industrial graphical user interfaces for monitoring & control of manufacturing equipment & processes; participation in technical reviews of end user specifications; appraisal of new software applications & technology; review electrical drawings & specifications; consult with electrical & design engineers concerning the design & development of electrical control equipment; assist in testing electrical control equipment & circuits; assist Sales with bid proposals & project cost estimations; project management & direct other staff in the successful completion of projects.: B.S. or equivalent in Computer Science; 2 yrs. Experience in job offered or as Database Analyst, or Technical Support Specialist or Manager, or Electrical Engineer, or combination of the above. Experience must include working with Oracle, SQL Databases, UNIX Operating System management and administration, managing large mission critical Database Systems; electrical drawings and specifications. Send resumes with the reference number included to: MJJ/ESA, P. O. Box 11170, Detroit, Michigan 48211-1170. Reference No. 80999. Employer Paid Ad.



Rocket

Rocket Software, Inc. leads the market in developing business intelligence software for IBM's multi-platform DB2 database. We are growing quickly and looking for people interested in joining our fast-paced environment.

Rocket has the following positions available at all levels

- BUSINESS ANALYST** - Meet with customers and developers to design front end applications
 - SENIOR SOFTWARE ENGINEER** - Lead the design and development of the Rocket query & reporting tools for DB2.
 - SOFTWARE ENGINEER** - Design, develop and test the Rocket family of products.
 - CHIEF OPERATIONS MANAGER** - Oversee accounting & administration functions and assist the President with supervision of sales, technical support and information systems.
- Rocket Software, Inc is an equal opportunity employer.
- E-mail, mail or fax resumes to:
 melissa.welch@rocketsoftware.com
 Rocket Software, Inc.
 Attn: Corporate Development
 Two Apple Hill
 Natick, MA 01760
 Fax: (508) 655-9447

www.rocketsoftware.com

SENIOR CONSULTANT Software Systems Engineer & Analyst
 Design, develop and research functional software systems specializing in either programming languages, databases or internet development and perform sub-system design/implementation in the remaining two areas. Requires MS CS/CE with 3 yrs exp or BS CS/CE with 5 yrs exp in all phases of software design/development cycle and demonstrated knowledge in Client/Server, Visual Basic, MS Access, and Windows NT plus at least one of the following: C++, SQL Server 6.5/7.0, Site Server, IIS, MIS, ASP, Oracle, or Javascript. Experience may precede degree. Send applications to L. Cryan, Eggrock Partners, LLC, 30 Monument Square, Concord MA 01742; FAX: 978-287-4680. EOE

Interactive Edge, Inc., an interactive multimedia software development co., seeks candidate's for the following positions:
Chief Technology Officer-Manage and administer the technological function of the organization, and direct the research and design of new technologies and in-house developed products. Master's Degree in Computer Sci., Math or Eng'g plus 2 yrs. exp. in a programming/software development occupation and knowledge of C/C++, Windows 95, Windows NT, SQL and UNIX req. (Ref: NWH)
Director of Multimedia Division-Manage and direct multi-media programming and graphic design staff in the production of multimedia presentations and web-sites. Master's Degree in Computer Sci., Math or Eng'g or related field plus 1 yr. exp. in software system development management field req'd. Knowledge of Director, Shockwave, Premier and After Effects (Video), Photoshop, HTML Programming and Visual BASIC req'd. (Ref: MJJ)
 Technical skills may be attained either through education or exp. Send Resumes to: Interactive Edge, Inc., Attn: Cynthia Carnesi, 7 W. 18th St., New York, NY 10011.

Web Project Manager
 Manhattan - Consult with clients and plan, direct and coordinate activities of web design projects such as intranets, extranets and extranets. Research, design and develop client systems utilizing existing software applications, in conjunction with hardware products, for medical, industrial, scientific and communication industries. Supervise the development of software system testing procedures, programming and documentation. Establish work plans and project specifications including time frame, budgeting, project procedures, staffing requirements and allotment of available resources to project development. Direct a team of 20 programmers and developers to ensure project progress is on schedule and within budgetary parameters. Prepare project reports for management and clients. Req'd: Must have 5 years in position offered or 5 years experience in a Senior Systems or Software Development position. Must have experience with RDBMS, Java Servlets, Java, Perl, CGI, UNIX, C/C++, and Apache. At least 40 hours per week.
 Send your resume and salary requirements to careers@sensenet.com or fax it to 212 590-6097

SENIOR SAP CONSULTING MANAGER. Multiple openings for full-time Senior SAP Consulting Manager. Responsibilities include: manage design, development, implementation and customization of SAP software systems and SAP R/3; manage the planning and coordination of activities for projects to ensure that goals and objectives are met within specified time frame and budget; manage the production and negotiation of new project proposals to determine time frame, funding, implementation procedures and staffing requirements; manage the preparation and analysis of reports on SAP systems; manage the recruitment, hiring, firing and assignment of professionals and support personnel; manage the development of work plans detailing specific duties, responsibilities and procedures for implementing SAP software systems; and serve as corporate liaison with client. Travel as required to client sites throughout the United States Monday - Friday. Must have a Master's degree in computer science, accounting, engineering or a related field and three (3) years of progressive experience in SAP systems analysis or a Bachelor's degree in computer science, accounting, engineering or a related field and five (5) years of progressive experience in SAP systems analysis. Salary Range: \$75,000 to \$100,000 per year. Must have proof of legal authority to work in the United States. If interested, submit resume to: Ms. Michelle O'Donnell, Director, Human Resources Prescient Consulting, Two Concourse Parkway, Suite 275, Atlanta, GA 30328

Positions available in expanding Newton, MA-based company that develops, globally markets, implements, and supports enterprise resource planning ("ERP") software components with specialized business solutions.
 Senior Int'l Applications Analyst - Provide internal/external application education. Perform QA testing of error corrections. Act as key contact to Latin American customers & affiliates. Reqs a Bachelor's or equiv in CS, Eng'g field, or rel. field, plus experience supporting manufacturing s/w.
 Senior & Principal S/W Engineers - Use OOD, C++, MSVC++ to dvlp & maintain large manufacturing application s/w. Design, analyze & implmnt algorithms for planning & scheduling. Perform bug fixing and code reviews on moderate to complex code. Reqs M.S. or equiv in CS, Eng'g field, or rel field plus exp in s/w dev't.
 D/B Consultants - Install, configure, & tune technical aspect of company software. Perform configuration & troubleshooting for clients internally & externally. Reqs a Bachelor's or equiv. in CS or rel field plus industry experience.



Polyfibrion Technologies, Inc., a leading manufacturer and distributor of printing supplies worldwide, has an immediate need for an:

SAP Administrator/Programmer

Duties: Design, develop, maintain, and implement software applications in VC++, VB and SQL Server for an SAP system. Perform system administration using Oracle and MS SQL. Review application functions, prepare technical specifications and program structure, and perform object-oriented coding in VC++, test, debug and document applications.

Requirements: MS or equivalent in Computer Science with 2 yrs. of database development/administration experience including SQL and Oracle.

PTI offers an outstanding benefits package including dental, 401(k) plan, retirement plan and tuition reimbursement.

Please send resumes to:
 Polyfibrion Technologies, Inc., Job Code: 1024,
 900 Middlesex Turnpike, Bldg 2
 Billerica, MA 01821, Fax: (978) 439-2192.
 Equal Opportunity Employer

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Senior Software Developer Research, design and develop computer software applications for money transfer and messaging operations. Formulate and design operating system software using Visual C++ and Borland C++ on Sql Server and Dbase IV databases. Evaluate interface between hardware and software, to determine operational and performance requirements for software within time and cost constraints. Provide technical support for software testing procedures, programming and documentation.

PROJECT ENGINEER to lead a team of software engineers and programmers to provide on-site software consultancy for complete project management to analyze, design, develop and implement software systems for three tier architecture systems, mainframe systems running MVS/ESA and OS/390 operating systems and UNIX compatible systems, communications protocols X.25, Frame Relay, ISDN and message switching systems; satellite communications, UNIX internals, IBM mainframe ES/9000 MVS system tuning, DB2 administration, CICS administration and RACF administration; provide application system maintenance on IBM mainframe ES/9000 running MVS/ESA; network management and digital signal processing using (C, C++, JAVA and ES/9000 Assembler language, Intel Assembler languages; redesign of compilers. Require: M.S. in Computer Science/Mathematics and five years experience in the job offered or as Software Engineer. 50% travel to client sites within the United States required. Salary: \$65,000 per year, 8:30 am to 5:00 pm, 40 hours/week, M-F. Mail resume to: President, YASH Technologies, Inc., 2100 Parklake Drive, NE, Suite F, Atlanta, GA 30345-2167.

INFOTECH CONSULTING, INC.
Software Engineers, DBAs, Sr. Project Leads
 A multi-million dollar consulting firm is seeking qualified technical professionals with 4-yr. college education & 5+ yrs. exp. or MS in Computer Science/Related Subjects & 2+ yrs. exp.:

- ORACLE 8.x/7.x-- Developers, Designers
- PowerBuilders 6.0/5.0
- AS400: RPG/400, CL/400, DB2/400, QUERY/400
- UNISYS Mapper/COBOL
- Web Developers
- IBM Mainframers
- C, C++, JAVA, JDBC
- SAP, Peoplesoft, BPCS

Also looking for **PROGRAMMER/ANALYSTS** with a Bachelor's & 2 yrs. of exp. in analysis, design, development, implementation & maintenance of software applications in the above listed areas. Candidates must be willing to travel & relocate. Send resume to: Recruitment CWW, Infotech Consulting, 3461 Market St., Ste. 303, Camp Hill, PA 17011 fax: 717-731-9857; e-mail: vyohn@icbtl.com. Visit our web site at <http://www.icbtl.com>

C++ DB2 DEVELOPER ENGINEERS
 Problem analysis, core algorithm development, mathematical modeling and maintenance in C++, DB2 development & support of RISC 6000; AIX UNIX, C++, DB2. Requirements: M.S., C++ & DB2 on RISC 6000, AIX UNIX experience. Job in Burlington, Vermont area. Competitive salary and benefits. Contact: S. Pine, Prosoft Technologies, Inc., 45 Swift Street, South Burlington, VT 05403. Ref. Ad #103

Consultants (various levels) - Provide implementation consulting svcs for company's products, including problem analysis & resolution, to clients. Reqs a Bachelor's or equiv. in CS, Systems Analysis, or rel field, plus industry experience.
 Programmer Analysts (various levels) - Provide application analysis & programming svcs to integrate company's AS400 business application s/w products into client's IS env't. Perform design & analysis. Reqs a Bachelor's or equiv in CS or rel field plus industry experience.
 Resumes to: HR, Marcam Solutions, Inc. 95 Wells Avenue, Suite 1-1, Newton, MA 02159.

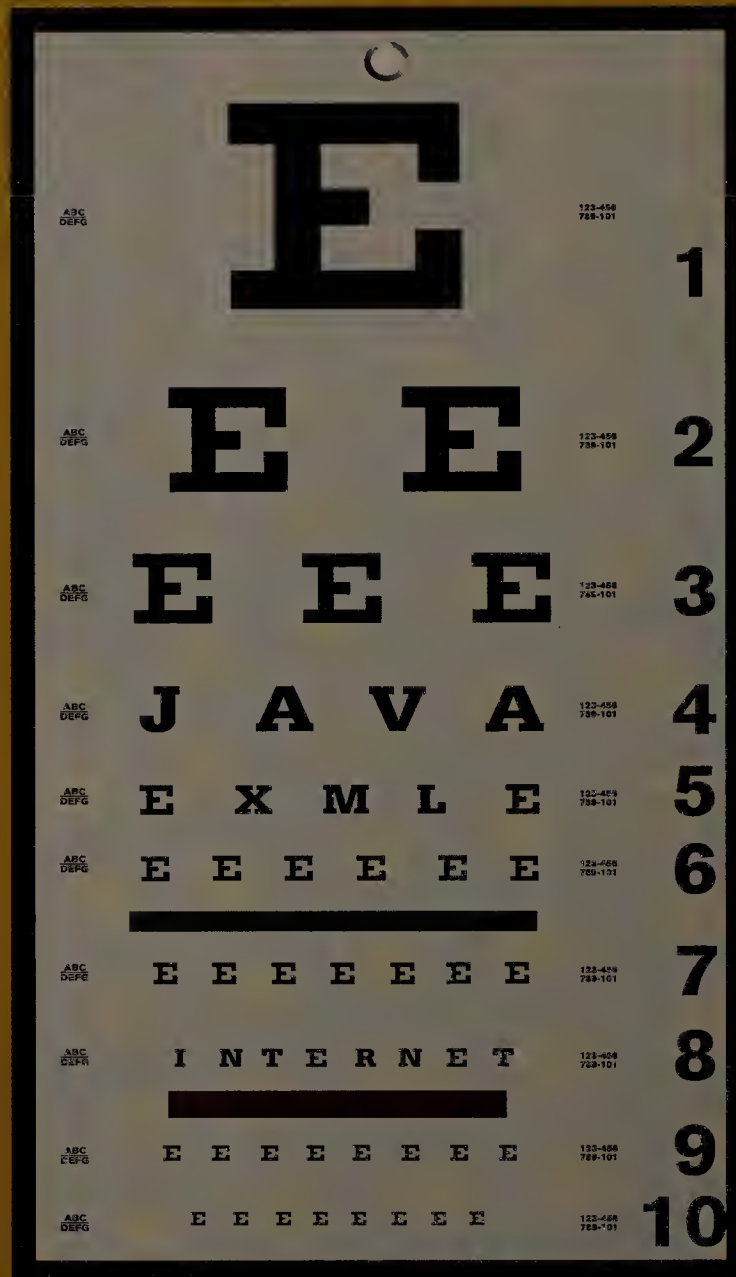
SOFTWARE ENGINEER to analyze, design, develop, test and support object-oriented financial applications software using Visual C++, MFC, COM, DCOM, Active X and ATL; develop stored procedures in Oracle, MS SQL Server, SYBASE and DB2; develop various reports using Crystal Reports, Actuate Reports on Windows NT; design, develop, test and support Web-based applications using HTML, XML, Java Script, VB Script, Java, ASP, LDAP, NAS (Netscape Application Server), NAB (Netscape Application Builder), NES (Netscape Enterprise Server), PWS (Microsoft Personal Web Server) and Java Web Server on Windows NT, Sun Solaris 2.X; and generate XML files from legacy file format by using Mercator mapping tool. Require: M.S. (or equivalent) in Computer Science and two years experience in the job offered. 40% travel required to customer sites within the United States. Salary: \$62,000 per year, 8:30 am to 5 pm, M-F. Mail resume to: President, YASH Technologies, Inc., 2100 Parklake Drive, NE, Suite F, Atlanta, GA 30345-2167.

SYSTEMS ENGINEER LEADER
 Leads team in UNIX using C/C++, OOPS (Object Oriented Programming Systems) and shell scripts for SCM (Supply Chain Management). Will apply mathematical modeling skills in Structured System Analysis, Design, Development and use of MSPROject for task planning, scheduling and tracking. Reqs: M.S. or B.S. and 5 years post-B.S. progressive experience in the specialty (structured systems analysis, design and development). Major Field of Study: Engineering, Comp. Sci. or any related field; 3 years concurrent exp. as team leader in UNIX and C/C++. \$60,000 per year, 40 hours per week, 9-6 PM. Job in South Burlington, Vermont area. Send resumes to: Job Order No. 615627, Jobs and Training Division, Vermont Dept of Employment & Training, PO Box 488, Montpelier, VT 05601-0488.

SVI America Corp. is an information management and technology consultancy w/ offices throughout the US. We work w/ many organizations to develop integrated solutions that transform their enterprises. By understanding the key components that drive an organization, we are providing tangible results & a competitive advantage to our clients. SVI America Corp. presently requires Programmer Analysts w/ the following qualifications: a BS in Comp Sci, Math, Eng'g, Business Admin or a related discipline, 1 yr exp in job offered, as well as working experience w/ COBOL, RDBMS and ORACLE. Must be willing to temporarily relocate to client sites throughout the US. To apply, please contact HR Department, SVI America Corp. 6201 Fairview Rd., Suite 200, Charlotte, NC 28210.

Mayer Freeman

Sometimes you need the Big Picture to know where to zoom in. That's why Software Development '99 offers both breadth of technologies and depth of content for building your Internet strategy. SD '99 is the only independent conference that gives you all the options and lets you decide where to focus your vision. That includes not just Internet technologies like XML and Java, but core languages, enterprise development, and platforms such as Linux and Windows 2000. Best of all, SD '99 lets you mingle with your peers at parties and events, or peer into the future with industry visionaries. Because when it comes to software development, opportunities in the future are closer than they appear.



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Y2K Hurts IBM But Not Microsoft

Off-the-shelf vendors may go unscathed

BY MATT HAMBLIN

RECENT QUARTERLY reports provide insight into how Y2K will impact big computer companies. As IBM (NYSE:IBM) and Microsoft Corp. (Nasdaq:MSFT) have shown, the impact can be pretty different, depending on what's being sold.

IBM reported server sales lower than analysts' expectations and warned that the year 2000 freeze at some firms would affect hardware sales for the next two quarters [News, Oct. 25].

That same week, Microsoft was crowing about a 28% revenue increase over the same quarter last year, saying that Y2K hadn't had a significant impact on results. Microsoft also sees growth in PC unit sales continuing in the current quarter, which will fuel more demand for its Office 2000, NT Server, BackOffice and other products.

It isn't simply that software vendors will do well and hardware vendors will have trouble. Analysts say they expect to see more serious Y2K impacts on vendors that depend on large-scale installations such as data center servers, for which users had to begin fix-

ing custom code years ago. On the other hand, sales of packaged software that represents a less-hefty investment shouldn't be hurt, analysts said.

"The impact of Y2K on Microsoft will be pretty minor," says analyst Michael Kwatinetz at Credit Suisse First Boston in New York. But profits and revenue for software companies such as SAP AG (NYSE:SAP) and PeopleSoft Inc. (Nasdaq:PSFT) "blew up a year ago," when information technology departments began halting enterprise resource planning implementations prior to Y2K, he says.

Microsoft is also somewhat insulated from a Y2K hit because its revenue stream is diversified, analysts say. "It's easy to lock down a data center for Y2K but much harder to restrain growth in business centers and with consumers," says Paul Dravis, an analyst at Bank of America Securities LLC in San Francisco.

Adds Drew Brousseau, an analyst at SG Cowen Securities Corp. in Boston: "Microsoft will be fine with Y2K, while IBM is mainly selling to legacy customers, where the Y2K problem is most acute."

Kwatinetz says that he expects Microsoft's revenue growth to continue through fiscal 2000, but at a rate of approximately 23%, rather than the 28% rate of the prior two years. He says that earnings growth should settle from this year's 54% to approximately 22%. ▀

IBM is mainly selling to legacy customers, where the Y2K problem is most acute.

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| LGO | 54.18-15.06 | Legato Systems Inc. | 52.44 | 3.88 | 8.0 |
| MACR | 63.50-15.37 | Macromedia Inc. (H) | 63.50 | 12.25 | 23.9 |
| MANU | 17.37-5.25 | Manugistics Group Inc. | 10.94 | 0.44 | 4.2 |
| MENT | 15.06-7.18 | Mentor Graphics | 8.00 | -0.03 | -0.4 |
| MSFT | 100.75-52.37 | Microsoft Corp. | 93.19 | 0.94 | 1.0 |
| NETA | 67.68-10.06 | Network Associates | 17.94 | 0.63 | 3.6 |
| NETA | 73.50-33.62 | Network General (H) | 72.81 | 4.88 | 7.2 |
| NOVL | 31.18-13.37 | Novell Inc. | 20.25 | 3.38 | 20.0 |
| ORCL | 48.12-18.12 | Oracle Corp. | 47.06 | 1.38 | 3.0 |
| PMTC | 22.25-11.68 | Parametric Technology Corp. | 18.69 | 1.38 | 7.9 |
| PSFT | 26.37-11.50 | PeopleSoft Inc. | 15.06 | 0.25 | 1.7 |
| PIXR | 135.25-40.00 | Pixar | 38.56 | 0.88 | 2.3 |
| RATL | 41.63-20.12 | Rational Software Corp. (H) | 41.63 | 4.31 | 11.6 |
| RHAT | 135.25-40.00 | Red Hat Inc. | 88.13 | 10.44 | 13.4 |
| QSFT | 70.00-20.50 | Quest Software (H) | 70.00 | 12.00 | 20.7 |
| SAP | 44.87-23.75 | SAP AG | 36.63 | 2.00 | 5.8 |
| SCUR | 29.00-2.25 | Secure Computing Corp. | 3.38 | 0.38 | 12.5 |
| SE | 46.43-17.93 | Sterling Commerce Inc. | 23.50 | 2.63 | 12.6 |
| 5SW | 28.00-18.12 | Sterling Software Inc. | 21.13 | 0.56 | 2.7 |
| SORC | 23.43-9.50 | Structural Dynamics Research | 9.50 | -0.63 | -6.2 |
| SYBS | 13.43-5.31 | Sybase Inc. | 12.88 | 0.44 | 3.5 |
| SYMC | 47.38-12.50 | Symantec Corp. (H) | 47.38 | 4.25 | 9.9 |
| SNPS | 65.12-37.12 | Synopsis | 60.25 | 4.91 | 8.9 |
| SCOT | 22.00-7.81 | Systems & Computer Technology | 11.25 | 0.56 | 5.3 |
| BAANF | 17.81-6.00 | The Baan Co. N.V. | 12.31 | 0.16 | 1.3 |
| VNTV | 15.81-6.00 | The Vantive Corp. | 11.63 | 0.06 | 0.5 |
| TIBX | 43.12-19.75 | Tibco Software Inc. (H) | 39.50 | 6.47 | 19.6 |
| TSAI | 51.00-24.18 | Trans. Sys. Arch. | 31.56 | 2.47 | 8.5 |
| VRTS | 107.06-23.87 | Veritas Software Corp. (H) | 107.06 | 13.31 | 14.2 |
| WINO | 33.43-11.25 | Wind River Systems Inc. | 20.38 | 0.69 | 3.5 |

| EXCH | 52-WEEK RANGE | | OCT. 29 2 PM | WK NET CHANGE | WK PCT CHANGE |
|--|---------------|--------------------------------|--------------|---------------|---------------|
| TELECOMMUNICATIONS CARRIERS UP 3.4% | | | | | |
| AT | 81.50-45.00 | Alltel Corp. (H) | 81.50 | 6.50 | 8.7 |
| ANDW | 22.87-11.00 | Andrew Corp. | 12.38 | -1.19 | -8.8 |
| T | 64.12-40.00 | AT&T | 47.19 | 4.19 | 9.7 |
| BCE | 59.50-31.37 | BCE Inc. (H) | 59.50 | 5.38 | 9.9 |
| BEL | 69.50-50.50 | Bell Atlantic | 64.94 | 2.25 | 3.6 |
| BLS | 51.37-37.75 | Bell South | 46.56 | 3.06 | 7.0 |
| CSN | 26.50-9.75 | Cincinnati Bell Inc. | 21.00 | -0.31 | -1.5 |
| CMCSK | 42.56-21.75 | Comcast | 41.31 | 1.88 | 4.8 |
| CQ | 39.62-17.25 | Comsat Corp. (L) | 17.25 | -4.13 | -19.3 |
| CDX | 45.00-25.56 | Cox Communications Inc. (H) | 45.00 | 3.00 | 7.1 |
| GSTRF | 33.00-12.62 | Globalstar Telecom. Ltd. | 21.81 | -3.56 | -14.0 |
| GTE | 78.50-56.43 | GTE Corp. | 74.94 | 3.00 | 4.2 |
| NXLT | 87.25-18.00 | NexTel Communications (H) | 86.44 | 1.75 | 2.1 |
| SPDT | 45.43-26.37 | Panamsat | 39.88 | 0.50 | 1.3 |
| QCOM | 225.75-24.50 | Qualcomm (H) | 222.00 | 3.25 | 1.5 |
| SBC | 59.93-43.87 | SBC Communications | 52.25 | 7.00 | 15.5 |
| FDN | 74.94-32.18 | Sprint Corp. (H) | 74.94 | 9.08 | 13.8 |
| TDS | 114.00-38.87 | Telephone and Data Systems (H) | 113.88 | 1.88 | 1.7 |
| TNI | 46.56-12.00 | Transilium Network Services | 39.88 | -0.31 | -0.8 |
| USW | 66.00-51.50 | US West | 61.44 | 2.06 | 3.5 |
| VIA | 49.62-28.43 | Viacom | 45.94 | 3.19 | 7.5 |
| WCII | 64.43-24.68 | Winstar Communications Inc. | 38.88 | 1.31 | 3.5 |
| WCDM | 96.75-52.56 | MCI Worldcom Inc. | 87.44 | 13.38 | 18.1 |

| EXCH | 52-WEEK RANGE | | OCT. 29 2 PM | WK NET CHANGE | WK PCT CHANGE |
|-------------------------|---------------|-------------------------------|--------------|---------------|---------------|
| SERVICES UP 0.3% | | | | | |
| ACXM | 31.25-14.56 | Axciom Corp. (L) | 16.38 | -6.44 | -28.2 |
| ACS | 53.00-31.75 | Affiliated Computer Servs | 38.81 | 3.00 | 8.4 |
| AMSY | 40.25-19.75 | American Mgt. Systems | 26.13 | 0.19 | 0.7 |
| AUD | 48.25-36.25 | Automatic Data Processing (H) | 48.25 | 1.38 | 2.9 |
| BSYS | 60.87-41.37 | Bsys Group Inc. | 50.56 | 4.56 | 9.9 |
| CATP | 32.25-10.62 | Cambridge Technology Ptnrs | 11.00 | -3.31 | -23.1 |
| CEN | 40.50-16.62 | Ceridian | 22.00 | 2.13 | 10.7 |
| CBR | 29.56-13.75 | Ciber Inc. | 16.31 | 0.25 | 1.6 |
| CDD | 30.87-10.75 | Comdisco | 20.19 | 1.13 | 5.9 |
| CHZ | 30.12-9.25 | Computer Horizons Corp. | 11.25 | -0.56 | -4.8 |
| CSC | 74.37-48.75 | Computer Sciences | 69.00 | 8.81 | 14.6 |
| OST | 70.25-48.06 | Dst Systems Inc. | 64.19 | 8.81 | 15.9 |
| EDS | 67.37-37.68 | Electronic Data Systems | 59.06 | 9.08 | 18.1 |
| FDC | 51.50-23.00 | Firsi Data Group | 45.94 | 1.06 | 2.4 |
| FISV | 40.75-24.12 | Fiserv | 31.94 | 1.75 | 5.8 |
| IT | 25.75-9.94 | Gartner Group | 9.94 | 3.06 | 23.6 |
| KEA | 43.62-17.25 | Keane | 23.50 | 0.00 | 0.0 |
| NDC | 55.25-21.75 | National Data | 23.63 | -0.44 | -1.8 |
| PAYX | 40.18-23.56 | Paychex Inc. (H) | 39.75 | 1.50 | 3.9 |
| PER | 85.75-15.31 | Perot Systems Corp. (L) | 16.75 | -0.06 | -0.4 |
| REGI | 14.50-2.68 | Renaissance Worldwide (L) | 3.19 | -0.44 | -12.1 |
| REY | 25.31-17.12 | Reynolds & Reynolds | 17.81 | -1.44 | -7.5 |
| SFE | 120.00-24.50 | Safeguard Scientifics | 87.00 | 7.88 | 10.0 |
| SAPE | 127.75-38.56 | Sapient Corp. (H) | 127.75 | 12.63 | 11.0 |
| SMS | 73.50-35.50 | Shared Medical Systems (L) | 37.81 | -7.56 | -16.7 |
| SOS | 41.93-16.87 | Sungard Data Systems | 23.94 | 1.88 | 8.5 |
| SYNT | 18.93-7.00 | Syntel Inc. | 8.13 | -0.19 | -2.3 |
| TECD | 45.50-14.50 | Tech Data | 19.00 | 3.63 | 16.0 |
| TENF | 39.50-17.00 | TenFold Corp. | 24.25 | 1.38 | 6.0 |
| TSS | 26.25-14.12 | Total System Services Inc | 18.56 | 0.31 | 1.7 |
| TSAI | 51.00-24.18 | Transaction Sys. Architects | 31.58 | 2.47 | 8.5 |

| EXCH | 52-WEEK RANGE | | OCT. 29 2 PM | WK NET CHANGE | WK PCT CHANGE |
|------------------------|---------------|-----------------------------|--------------|---------------|---------------|
| NETWORK UP 2.8% | | | | | |
| COMS | 51.12-20.00 | 3Com Corp. | 28.94 | 1.13 | 4.0 |
| AOCT | 53.62-22.37 | AOC Telecommunications Inc. | 47.25 | 1.31 | 2.9 |
| ANTC | 60.25-11.50 | Antec | 48.25 | 1.69 | 3.6 |
| BNYN | 19.37-3.37 | Banyan Systems Inc. | 10.25 | 1.00 | 10.8 |
| CS | 19.93-7.18 | Cabletron Systems | 16.50 | 1.63 | 10.9 |
| CNEBF | 9.75-3.93 | Call-Net Enterprises | 5.38 | -0.38 | -6.5 |
| CSCD | 73.63-30.06 | Cisco Systems Inc. | 73.63 | 3.38 | 4.8 |
| ECIL | 45.00-23.75 | Eci Telecom | 29.00 | 0.44 | 1.5 |
| ENTU | 43.06-14.25 | Entrust Technologies Inc. | 24.13 | 1.13 | 4.9 |
| HRS | 40.62-22.37 | Harris Corp. (L) | 22.44 | 1.44 | 6.0 |
| GMH | 73.50-33.62 | Hughes Electronics/GM (H) | 72.81 | 4.88 | 7.2 |

| EXCH | 52-WEEK RANGE | | OCT. 29 2 PM | WK NET CHANGE | WK PCT CHANGE |
|-------|---------------|----------------------------|--------------|---------------|---------------|
| ERICY | 42.06-20.50 | LM Ericsson (H) | 42.06 | 3.58 | 9.3 |
| JNPR | 273.50-90.12 | Juniper Networks Inc. (H) | 273.50 | 15.81 | 6.1 |
| LIJ | 79.75-39.18 | Lucent Technologies | 64.50 | 7.88 | 13.9 |
| MAOGF | 5.18-1.56 | Madge Networks (L) | 1.56 | -0.53 | -25.4 |
| NCDI | 8.50-3.87 | Network Computing Dev | 4.56 | 0.06 | 1.4 |
| NWK | 13.68-7.31 | Network Equipment Tech. | 10.50 | 0.50 | 5.0 |
| NN | 39.87-18.12 | Newbridge Networks (L) | 18.44 | -2.13 | -10.3 |
| NDK | 116.69-42.75 | Nokia Corp. (H) | 116.69 | 11.56 | 11.0 |
| NT | 61.00-19.06 | Northern Telecom Ltd. (H) | 61.00 | 4.69 | 8.3 |
| PAIR | 16.12-6.87 | Pairgain Technologies Inc. | 12.06 | -0.69 | -5.4 |
| PCTL | 11.00-3.25 | Pictoretel (L) | 3.75 | 0.19 | 5.3 |
| SFA | 58.81-14.12 | Scientific Atlanta | 57.25 | 2.31 | 4.2 |
| TLAB | 74.00-25.00 | Tellabs Inc. | 63.25 | 0.88 | 1.4 |
| USW | 66.00-51.50 | US West | 61.44 | 2.06 | 3.5 |
| VRK | 8.28-1.81 | Verlink | 2.00 | 0.09 | 4.9 |
| WSTL | 11.18-3.62 | Westell Technology Inc. | 7.13 | 0.31 | 4.6 |

| EXCH | 52-WEEK RANGE | | OCT. 29 2 PM | WK NET CHANGE | WK PCT CHANGE |
|--|---------------|-------------------------------|--------------|---------------|---------------|
| SEMICONDUCTORS, CHIPS & EQUIPMENT UP 8.6% | | | | | |
| ADPT | 44.56-14.12 | Adaptec | 44.56 | 5.19 | 13.2 |
| AMD | 33.00-14.56 | Advanced Micro Devices | 19.81 | 1.13 | 6.0 |
| ALTR | 55.68-20.18 | Altera | 49.19 | 0.44 | 0.9 |
| ADI | 60.43-18.00 | Analog Devices | 53.63 | 3.63 | 7.3 |
| AMAT | 89.44-31.12 | Applied Materials | 89.44 | 7.94 | 9.7 |
| ASML | 74.62-22.25 | ASM Lithography Holding | 72.13 | 4.13 | 6.1 |
| FCS | 32.00-18.50 | Fairchild Semiconductor Corp. | 26.06 | | |

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Hershey

having trouble pushing orders through the new system, resulting in shipment delays and deliveries of incomplete orders. Last week, when Hershey announced a 19% drop in third-quarter profits, CEO Kenneth Wolfe said the system fixes are taking longer than expected and are requiring more extensive changes.

When the difficulties first came to light, Hershey vowed to get shipments back to normal by this week. But during a conference call with financial analysts, Wolfe said he now doesn't expect that to happen until the end of the year, if not later. "This is a difficult bear that we have here," he said.

The company recently spent two days reviewing the new system. It developed a list of changes that need to be made to improve things such as the view of product inventories that end users get and the way information flows between different applications, Wolfe said. "But they need to be tested before we put them in, and we can't get that done [right away]," he added.

Hershey wouldn't specify whether the problems stem from its configuration of the system or the software itself, which also includes planning and scheduling applications developed by Manugistics Group Inc. in Rockville, Md., and a pricing promotions package from Siebel Systems Inc. in San Mateo, Calif.

Tom Crawford, general manager of the consumer products business unit at SAP America Inc. in Newtown Square, Pa., said the company has consultants on-site at Hershey to help resolve problems. But no revisions of R/3 are in the works for Hershey, he added.

"There are really no software issues per se, in terms of bugs or fixes that need to be applied to make [R/3] work any differently than it is now," Crawford said. The SAP workers "are just making sure they're using the business processes [built in to the software] correctly."

Manugistics said it's working with Hershey and the other vendors on "business process improvements." A spokesman for IBM, the lead consultant on the project, said the new system required "enormous" changes in the way Hershey's workers do their jobs. Siebel officials weren't available for comment.

Hershey's plants continue to churn out products such as Hershey's Kisses and the company's namesake candy bars, but the chocolates are piling up in warehouses instead of sitting

on store shelves. Product inventories at the end of September were up 29% from last year's levels because of the order-processing problems, according to Hershey executives.

"They've missed Halloween, they're probably going to miss Christmas, and they might even start missing Easter," said William Leach, a financial analyst at Donaldson, Lufkin & Jenrette Inc. in New York.

Hershey turned on some of SAP's finance applications, plus its purchasing, materials management and warehousing

modules, in January. The order-processing and billing portions of R/3 were added along with the Manugistics and Siebel packages in July — three months later than Hershey had hoped, a spokesman said.

Jim Shepherd, an analyst at AMR Research Inc. in Boston, said most companies install ERP systems in a more staged manner, especially when applications from multiple vendors are involved.

"These systems tie together in very intricate ways, and things that work fine in testing

can turn out to be a disaster [when you go live]," Shepherd said. He added that the software Hershey turned on all at once in July was "a huge bite to take, given that [processing orders] is the lifeblood of their business."

At Hershey, the system problems will likely result in lost market share and could lead fed-up retailers to drop some of the company's products from their shelves, Wolfe said.

"Clearly, our customer relations have been strained," said Senior Vice President Michael Pasquale. ▀

Continued from page 1

Banking

challenge — for banks as they move forward will be to apply customer relationship management and data mining technologies to help them determine who their most profitable customers are and transform their service-oriented call centers "into sales-based call centers," said Bradway. Banks that have begun making progress with their call centers include The Dime Savings Bank of New York and Fleet Boston Corp., said Bradway.

Advances in customer relationship management systems have made it easier to cross-sell products to customers from different business units, said Jonathan Vaughan, vice president of information sys-

tems at The Prudential Insurance Company of America in Roseland, N.J.

The thornier challenges for financial institutions, said Vaughan, are in resolving compensation conflicts among competing business units (for example, who gets credit for selling a customer an annuity).

Cross-selling products "is not a big technology problem unless your organization faces scale issues," said Vaughan. Still, Vaughan, who prior to joining Prudential was an IT executive at The Chase Manhattan Bank in New York, agreed that banks are generally behind brokerages and insurers in transforming their call centers to customer-centric, sales-oriented operations.

One bank that has had success in cross-selling its products to new customers is First Union Corp. in Charlotte, N.C.

For example, after First Union acquired First Fidelity Bancorp. in January 1996, the bank was able to identify and cross-sell mutual fund products to First Fidelity customers, in part by analyzing and targeting those customers using its customer data warehouse, said Austin Adams, executive vice president of the bank's automation group. That helped the bank generate a 30% to 50% increase in mutual fund sales per salesperson, Adams said.

An agreement reached last week between Congress and the White House would remove nearly all of the Depression-era barriers that prevented banks, brokerages and insurers from merging with one another. But privacy advocates are concerned about customer data being shared by the bank and insurance affiliates of a merged company.

Such "affiliate sharing" is "very much at odds with traditional privacy protection," under the principle that information collected for one purpose shouldn't be used for another purpose, according to recent testimony by the Electronic Privacy Information Center.

The latest draft of the bill requires financial institutions to craft privacy policies and inform consumers.

Analysts said they expect bank executives to face still other technology challenges as their organizations acquire new companies and add to their already hefty transaction processing loads. For example, as big banks like Bank of America Corp. in Charlotte, N.C., and Citigroup Inc. in New York grow larger through acquisitions, they also have to process more transactions each night through their existing batch processing systems.

Many banks "would like to shift away" from their reliance on batch systems, but they're currently "faced with shorter and shorter windows to conduct their batch runs each night," said Mike McEvoy, an analyst at TowerGroup in Needham, Mass.

Even though vendors such as IBM and Sanchez Computer Associates Inc. in Malvern, Pa., have developed systems designed to alleviate these workloads, said McEvoy, "they just aren't scalable enough to handle, say, 25 million accounts" at a major bank. ▀

Washington bureau chief Mitch Betts contributed to this story.

Continued from page 1

PeopleSoft

the cost of the software itself, after Deloitte & Touche had provided an estimate of less than half that amount.

Both PeopleSoft and Deloitte & Touche declined to comment on the allegations.

Gore has 6,100 employees in 45 locations around the world who help bring in the company's \$1.25 billion in annual revenue from its breathable fabric, which is used in outerwear, hernia repair patches, dental floss and guitar strings. Founded in

1957, the family-run company is known for its consensus-driven, "boss-less" structure.

Gore counsel Jay Eisenhofer said the company was forced to hire integrators from PeopleSoft to reinstall the software. Eisenhofer said the company's human resources, benefits and payroll administration were in chaos subsequent to taking the PeopleSoft application live in July 1997. "They have no complaints with the PeopleSoft software," he said, "but the partnership is a big, sophisticated scam."

While Gore's allegations are pointed, the cause of the apparent failure within the firm may

be indeterminable, information technology consultants and users said. Pleasanton, Calif.-based PeopleSoft confirmed that Deloitte & Touche is a service partner in PeopleSoft's outsourcing certification program.

"It's never necessarily just the implementation partner" influencing success or failure, said Tatia Wagner, vice president of business development at Carrera-Maximus, a Sacramento-based consulting firm and a PeopleSoft-certified integrator. Gore employees acknowledged that the company's unusual culture and structure could be a factor in its troubles. ▀



FRANK HAYES/FRANKLY SPEAKING

History's lessons

IN 1981, *Computerworld* ran a 12-part series called "The History of Computing." The first 11 parts were profiles of big names in IT history — from Pascal and Leibniz to Grace Hopper. Part 12 was a look ahead at computing's future. What's striking almost two decades later is the roster of things the look ahead didn't foresee. The Internet. Desktop computers. Unix. Microsoft. Spreadsheets. Laser printers. Graphical user interfaces. Object-oriented programming. C. Distributed computing. They existed in 1981 — and they're all crucial to corporate IT today.

But what did we think the most important future technologies would be, back in 1981? Josephson junctions, artificial intelligence and industrial robots.

Pretty dumb, huh?

Nope. Actually, that's what any reasonable analyst would have predicted then. Marguerite Zientara, who wrote the series, took it as a given that the most important IT progress would be toward machines that were faster, smaller and more reliable.

Obviously, that kind of performance would have to come from miniaturized, supercooled switches (Josephson junctions) instead of conventional integrated circuits. And obviously, all that extra computing power would be focused on giving computers humanlike smarts (artificial intelligence) and putting them to work doing humanlike jobs (as robots).

What we know now — what it's easy for Monday-morning historians to see — is that corporate IT made a few unsignaled left turns off that obvious path.

Business users discovered Visicalc and smuggled Apple IIs into the office. Microsoft sold someone else's DOS to IBM for its new Personal Computer. Steve Jobs swiped a GUI from Xerox for Apple's Macintosh, making the laser printer a necessity. LANs begat WANs, the Internet went commercial, and today that 1981 vision looks downright blind.

Fortunately for us, as we sit here on the cusp of the millennium — remember, just nine shopping weeks left till zero hour — we can smirk at that early-'80s naïveté. Because we know *exactly* what our IT future looks like. Right?

We'll get our processing power from ever-smaller integrated circuits. Or quantum transistors. Or molecular switches. Or biocomputers.

We'll have the Internet, where we'll make our money in content . . . er, advertising . . . um, customer service . . . ah, e-commerce.

Our data will be in distributed databases, or maybe recentralized data warehouses or perhaps we'll use XML and the Web somehow.

Our networks will be copper, or fiber, or wireless or maybe belong to the phone company, cable company, a software vendor or AOL.

Our applications will be bought, or built, or rented or automatically generated from a business plan to run on mainframes, servers, PCs, handhelds, laptops, cell phones or maybe WebTV.

Our work will be done by high-school kids, H-1B contractors, Ph.D.s, outsourcers, retired part-timers or possibly our users, who will input data with speech, handwriting, keyboards and touch pads but will still have to clean the lint and gunk out of their mice.

And our biggest security concern will be government encryption back doors, or hackers, or political activists, or industrial spies or some disgruntled mail room clerk with a screwdriver and a little knowledge.

Wait a second — that's not a vision of the future. Unless by *the future* you mean about 15 minutes from now.

So next time you feel smug about how much better you can

see your IT future than those analysts from 1981 could, just remember:

On the path ahead, those unsignaled left turns aren't the exception. They're the rule. ▀

Hayes, *Computerworld's* staff columnist, has covered IT for 20 years and still thinks Josephson junctions were cool. His e-mail address is frank_hayes@computerworld.com.

IT's
unsignaled
left turns
aren't the
exception.



SHARK TANK

SO THESE CONSULTANTS notice that a client's satellite office uses PCAnywhere over the Internet to connect to an outsourced billing service. A quick test shows that the network connection the service set up on the client's network is "completely, pants-down-around-the-ankles open," a pilot fish reports. Billing service denies it, but a test hack flat-out proves the billing service was lying. Chalk up one grateful client — and, the Shark hopes, one fired billing company.

GREAT CAESAR'S GHOST! Workflow consultant Thomas J. Piwowar, out of Washington, tells Sharky that a U.S. newspaper got all weak-kneed looking at a software vendor's awesome feature list, but forgot all about its need for strong workflow — not the app's strong suit. The result: "Now I'm getting paid to rip out a multimillion-dollar system," Piwowar says. That could never happen at your company, right?

FALL BACKWARDS An Ithaca pilot fish shot Sharky an internal memo warning Cornell University's hourly employees that be-

cause daylight-saving time adds an hour to the last day of October, the school's time collection system might shift the hours they register Monday 11/01/99 to Tuesday, shift Tuesday's hours to Wednesday and not let them enter Wednesday hours at all. Doesn't bode well for Cornell's Y2K program.

AH, YOUTH. Know anyone who sweated over a Microsoft Certified Professional certification? Subia Hashmat, 11, of Allahabad, India, just became the world's youngest MCP, acing out neighbor Supriya Singh, 12.

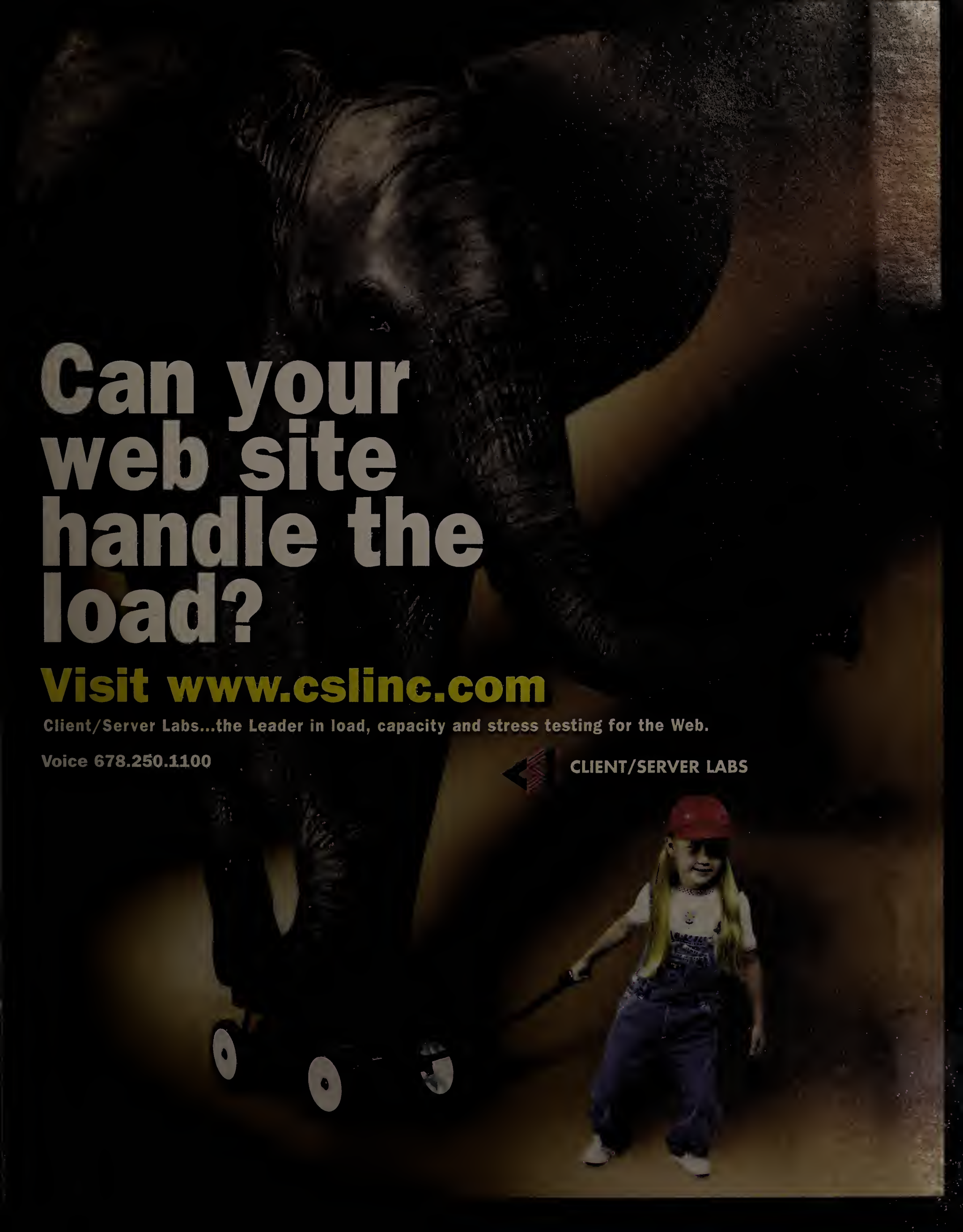
MOTTO OF THE WEEK goes to SysAdminsRus.com, a job-search site out of Petaluma, Calif. Its Web site proclaims: "Tech ops jobs for the New Linoleum!" Tank thanks go out to Michael for passing that one along.

Floor the Shark with some IT scoop: sharky@computerworld.com. For plush wall-to-wall Shark, installed daily, check out computerworld.com/sharky.

The 5th Wave



"Wait! Wait! Wait! You've got a lung and two eyeballs in there! I thought you said you were At Certified?"



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